Vol. 941 Number 1

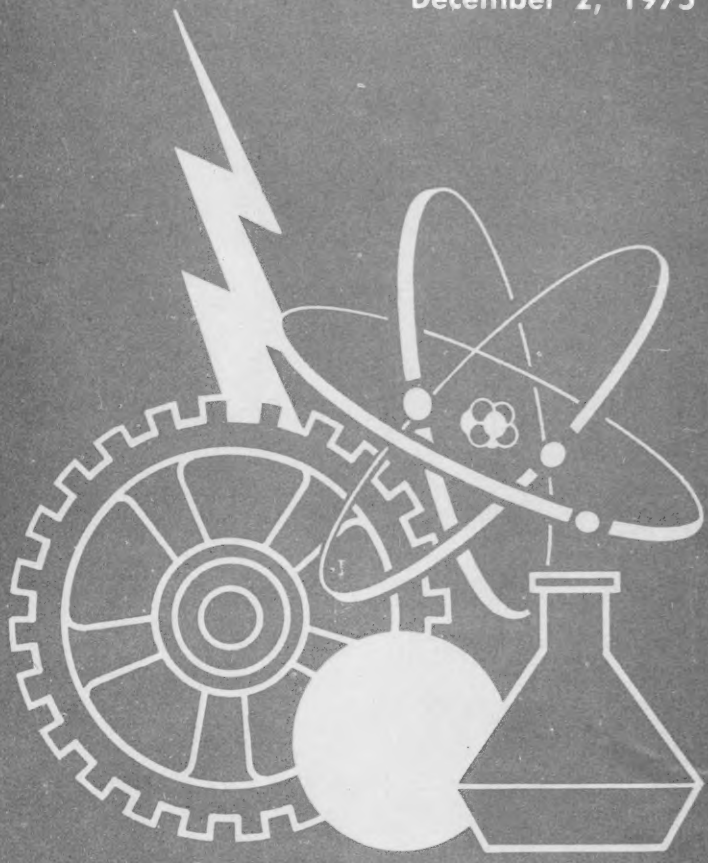
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 2, 1975



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

December 2, 1975 Volume 941 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of October 1975

Examiner affirmed	225
Examiner affirmed in part	47
Examiner reversed	87
Total	359

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,893,419, A. L. Coulter, HAND-CHOKE CONVERSION UNIT, **filed** Aug. 13, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2715, *MJR Industries* v. *Auto Craft, Inc.*

3,017,323, Gordon, Stephens, Noseworthy and Teare, THERAPEUTIC COMPOSITIONS COMPRISING POLYHYDRIC ALCOHOL SOLUTIONS OF TETRACYCLINE-TYPE ANTIBIOTICS, **filed** Feb. 11, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–353–RJK, *Pfizer, Inc.* v. *International Rectifier Corp. and Rachelle Laboratories.* Pursuant to 28 U.S.C. Section 1407, action is transferred to the USDC for the District of Minnesota, entered Nov. 22, 1974.

3,051,822, Bernard and Bernard, WELDING WITH BLANKET AND GAS ARC-SHIELD, **filed** May 16, 1975, D.C. Conn. (New Haven), Doc. N–75–130, *Chemetron Corporation* v. *Unicore, Inc.* Stipulation for dismissal filed and so ordered, July 28, 1975.

3,215,072, Kooch and Fennimore, ADDRESS CARD; **3,526,262,** H. Yoshida, ADDRESS MASTER CARD, **filed** Apr. 3, 1975, D.C., S.D.N.Y., Doc. 75–C–1639, *Scriptomatic Inc.* v. *Mailers Equipment Co. Inc.* **Same, filed** Apr. 28, 1975, D.C. Minn. (Minneapolis), Doc. 4–75–C–194, *Speedaddress, Inc.* v. *Scriptomatic, Inc.*

3,215,072(*a*), Kooch and Fennimore, ADDRESS CARD; **3,526,262,** H. Yoshida, ADDRESS MASTER CARD; **Reg. No. 764,325** (SCRIPTMASTER), Scriptomatic, Inc.; **Reg. No. 785,470** (SCRIPTOMATIC), same; **Reg. No. 785,623,** same, **filed** May 27, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–1773–IH, *Scriptomatic, Inc.* v. *Speedaddress, Inc. et al.*

3,218,588, J. G. Badger, TELEVISION TUNER, **filed** July 14, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2303, *Sarkes Tarzian, Inc.* v. *Alps Electric Co., Ltd. et al.* Filed plaintiff's notice of dismissal pursuant to Rule 41(a)(1)(1) of the FRCP, Aug. 4, 1975.

3,221,309, R. Benghiat, PRIORITY INTERRUPT MONITORING SYSTEM; **Re. 28,221,** same, **filed** Feb. 11, 1975, D.C. Del. (Wilmington), Doc. C.A. 75–39, *Western Electric Company, Inc. and American Telephone & Telegraph Co.* v. *The Riley Company.*

3,230,675, Frommelt and Frommelt, DOCK PADS WITH ADJUSTABLE HEAD PAD; **3,352,314,** same, LOADING DOCK SHELTER; **3,538,655,** same, LOADING DOCK SHELTERS; **3,557,508,** same; **3,638,667,** same, **filed** May 12, 1975, D.C., W.D.N.Y. (Buffalo), Doc. 75–178, *Dubuque Awning & Tent Company* v. *Weather-Shield Corporation.*

3,293,811, E. K. Rice, ANCHORAGE FOR CONCRETE STRESSING TENDONS, **filed** July 29, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–2544–DWW, *Atlas Prestressing Corp. and Harold D. Long* v. *Edward K. Rice.*

3,328,588, S. B. Steinberg, APPARATUS FOR MEASURING THE EFFICACY OF AN AIR FILTER; **3,473,876,** same, PORTABLE FILTER EVALUATION DEVICE; **3,810,697,** same, **filed** Mar. 22, 1973, D.C. N. Mex. (Albuquerque), Doc. 10022, *Samuel B. Steinbert and Air Techniques, Inc.* v. *Frontier Enterprises.* Order entered Feb. 28, 1975 that U.S. patents numbered 3,810,697, 3,328,588 and 3,473,876 are declared to be invalid, Apr. 7, 1975.

3,352,314. (See 3,230,675.)

3,399,834, R. C. Bradley, APPARATUS AND METHOD FOR FORMING PLASTIC ARTICLES, **filed** Aug. 4, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2586, *Ransburg Corporation* v. *Great Lakes Terminal & Transport Corp. et al.*

3,473,876. (See 3,328,588.)

3,514,028, A. V. Kowalczyk, APPARATUS FOR MANUFACTURING PIN BOARDS; **3,643,852,** same, NAIL CHUCK, **filed** July 29, 1975, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 75–2154, *Adam V. Kowalczyk* v. *Continental Tackless Corp.*

3,526,262. (See 3,215,072.)

3,538,655. (See 3,230,675.)

3,557,508. (See 3,230,675.)

3,620,367, O. G. Stembel, CASSETTE STORAGE CONTAINER, **filed** Feb. 19, 1975, D.C., S.D.N.Y., Doc. 75–C–0820, *Reliance Folding Carton Corp.* v. *A. Dudley Oslen and Associates.* It is hereby stipulated that the above entitled action be discontinued without prejudice, Aug. 8, 1975.

3,638,667. (See 3,230,675.)

3,643,852. (See 3,514,028.)

3,671,934, R. M. Teich, AUTOMOBILE THEFT ALARM FOR DETECTING UNAUTHORIZED ENERGIZATION OF RESISTIVE LOAD, **filed** Aug. 12, 1975, D.C.N.J. (Newark), Doc. 75–1380, *General Automotive Specialty Co., Inc.* v. *On-Guard Corporation of America et al.*

3,740,839, Otte and Fischer, CRYOGENIC CONNECTION METHOD AND MEANS; **3,832,603,** Cray and Roush, INTERCONNECT TECHNIQUE FOR STACKED CIRCUIT BOARDS, **filed** Aug. 25, 1975, D.C. Minn. (Minneapolis), Doc. 4–75–C–433, *Raychem Corporation* v. *Control Data Corporation.*

3,758,051, D. D. Williams, VELOCITY CONTROL AND ORIENTATION OF A SPIN-STABILIZED BODY; **Re. 26,887,** W. B. McLean, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE, **filed** Jan. 17, 1974, D.C Del. (Wilmington), Doc. 74–10, *Hughes Aircraft Company, William B. McLean and Walter G. Finch* v. *Philco-Ford Corporation.* Pursuant to Rule 41(a)(2) of the Federal Rules of Civil Procedure the above-captioned action is hereby dismissed without prejudice, such dismissal being, however, with prejudice to plaintiffs again filing in this court an action against defendant, Apr. 17, 1975.

3,810,697. (See 3,328,588.)

3,832,603. (See 3,740,839.)

3,851,814, L. J. Stage, GUSSETED ARTICLE, **filed** Aug. 22, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c829, *Arvey Corporation* v. *Harris Hospital Supply, Inc. and Dominic P. Vecchione.*

3,866,658, L. L. Smith, PIVOTAL SUPPORT AND GUIDE HARDWARE FOR FOLDING DOORS, **filed** Aug. 15, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75–713, *Lester L. Smith* v. *Acme General Corporation.*

3,867,806, Lancaster III and Lancaster, PROCESS OF MAKING A STRETCHED-WRAPPED PACKAGE, **filed** Aug. 21, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2817, *Lantech Inc.* v. *Interlake Inc.*

D. 220,644, L. D. Robinson, MONEY BOX, **filed** Aug. 18, 1975, D.C., W.D. Okla. (Oklahoma City), Doc. C–75–0700, *L. Elsworth Robinson and Leva Delores Robinson, individually and doing business as Cash Caddy Corporation* v. *Continental Plastics of Oklahoma, Incorporated.*

Re. 26,887. (See 3,758,051.)

Re. 28,221. (See 3,221,309.)

Reg. No. 764,325. (See 3,215,072(*a*).)

Reg. No. 785,470. (See 3,215,072(*a*).)

Reg. No. 785,623. (See 3,215,072(*a*).)

Certificates of Correction for the Week of Dec. 2, 1975

P.P. 3,733	3,871,684	3,889,596	3,899,924
Re. 28,224	3,871,836	3,889,900	3,899,961
Re. 28,253	3,871,839	3,890,026	3,899,981
Re. 28,500	3,871,933	3,890,377	3,900,003
Re. 28,504	3,872,149	3,891,507	3,900,207
D. 234,940	3,872,439	3,891,657	3,900,498
3,418,247	3,873,624	3,891,682	3,900,678
3,714,191	3,875,028	3,892,117	3,901,052
3,715,511	3,875,343	3,892,254	3,901,114
3,728,895	3,876,566	3,892,756	3,901,326
3,742,201	3,876,672	3,892,773	3,901,405
3,746,608	3,877,295	3,892,782	3,901,578
3,763,054	3,877,695	3,893,423	3,901,602
3,790,044	3,878,091	3,893,556	3,901,695
3,796,994	3,878,145	3,893,641	3,901,781
3,799,977	3,878,429	3,893,658	3,901,883
3,803,483	3,878,469	3,893,917	3,902,070
3,813,527	3,878,833	3,894,151	3,902,393
3,817,942	3,879,179	3,894,190	3,902,464
3,825,431	3,879,200	3,894,250	3,902,610
3,825,514	3,879,442	3,894,516	3,902,855
3,828,620	3,880,651	3,894,666	3,903,165
3,829,769	3,880,853	3,894,780	3,903,532
3,835,691	3,880,860	3,894,811	3,903,816
3,843,686	3,880,982	3,894,956	3,903,888
3,844,805	3,881,001	3,895,144	3,903,993
3,845,371	3,881,025	3,895,178	3,904,100
3,849,479	3,881,916	3,895,277	3,904,233
3,851,528	3,881,965	3,896,073	3,904,303
3,852,335	3,882,077	3,896,099	3,904,421
3,855,863	3,882,250	3,896,205	3,904,491
3,856,800	3,882,657	3,896,379	3,904,574
3,856,958	3,882,830	3,896,547	3,904,627
3,857,339	3,882,930	3,897,204	3,904,777
3,858,930	3,884,101	3,897,335	3,904,791
3,859,074	3,884,156	3,897,465	3,904,803
3,859,075	3,884,335	3,897,490	3,904,936
3,859,898	3,884,521	3,897,506	3,905,130
3,860,521	3,884,745	3,898,002	3,905,302
3,860,844	3,884,976	3,898,035	3,905,326
3,860,881	3,885,660	3,898,279	3,905,339
3,862,019	3,885,891	3,898,540	3,905,816
3,863,160	3,886,025	3,898,564	3,905,884
3,865,819	3,886,236	3,898,627	3,905,897
3,866,411	3,886,696	3,898,924	3,905,969
3,867,179	3,886,834	3,899,329	3,906,458
3,867,685	3,887,195	3,899,343	3,906,466
3,868,204	3,887,548	3,899,383	3,907,420
3,868,951	3,887,608	3,899,435	3,907,640
3,869,414	3,887,914	3,899,484	3,907,911
3,869,763	3,888,385	3,899,547	3,908,189
3,870,653	3,888,753	3,899,553	3,908,881
3,871,303	3,888,891	3,899,671	3,914,330
3,871,323	3,889,485	3,899,831	
3,871,597	3,889,592	3,899,868	

Dedication

3,771,972.—*Glenn R. Schaer* and *William H. Safranek*, Columbus, Ohio. COATED ARTICLE. Patent dated Nov. 13, 1973. Dedication filed Sept. 11, 1975, by the assignee, *Battelle Development Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

Disclaimer and Dedication

3,291,177.—*Kakuji Naito*, Kawasaki-shi, Japan. METHOD AND STRUCTURE FOR RECLOSABLE CONTAINERS. Patent dated Dec. 13, 1966. Disclaimer and dedication filed Sept. 30, 1975, by the assignee, *Kabushiki Kaisha Seisan Nihon Sha.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Disclaimers

Re. No. 28,079.—*Harry N. Andrews*, Murrysville, and *Herbert W. Keller*, Monroeville, Pa. MEANS FOR SUPPORTING FUEL ELEMENTS IN A NUCLEAR REACTOR. Patent dated July 23, 1974. Disclaimer filed Sept. 4, 1975, by the assignee, *Westinghouse Electric Corporation.*

Hereby enters this disclaimer to claims 1 to 7, inclusive, 14 to 25, inclusive, and 27 and 28 of said patent.

2,933,692.—*Stanley T. Meyers*, East Orange, N.J. TRANSISTOR SWITCHING AND REGENERATIVE PULSE AMPLIFIER CIRCUIT. Patent dated Apr. 19, 1960. Disclaimer filed Sept. 25, 1975, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1, 2, 6 and 7 of said patent.

3,500,114.—*Masahide Sawai*, Tokyo, Japan. CONVERGENCE SYSTEM FOR A COLOR PICTURE TUBE. Patent dated Mar. 10, 1970. Disclaimer filed Oct. 2, 1975, by the assignee, *Sony Corporation.*

Hereby enters this disclaimer to claims 5 and 6 of said patent.

3,642,314.—*Vernon O. Smith*, Ashley, and *John W. Binns*, Marion, Ohio. GRAVITY-ACTUATED LOCK. Patent dated Feb. 15, 1972. Disclaimer filed Oct. 22, 1975, by the assignee, *Overhead Door Corporation.*

The term of this patent subsequent to May 5, 1987, has been disclaimed.

3,658,858.—*Ian T. Harrison*, Palo Alto, Calif. DI-(6-METHOXY-2-NAPHTHYL)CADMIUM. Patent dated Apr. 25, 1972. Disclaimer filed Sept. 29, 1975, by the assignee, *Syntex Corporation.*

Hereby disclaims the entire remaining term of said patent.

3,694,476.—*Francisco Alvarez*, Sunnyvale, Calif. (6-METHOXY-2-NAPHTHYL) CADMIUM HALIDE. Patent dated Sept. 26, 1972. Disclaimer filed Sept. 29, 1975, by the assignee, *Syntex Corporation.*

Hereby disclaims the entire remaining term of said patent.

3,703,997.—*August P. Epina*, Boulder, and *Paul O. Pearson*, Longmont, Colo. DOOR CONSTRUCTION IN A MAGNETIC TAPE DRIVE SYSTEM. Patent dated Nov. 28, 1972. Disclaimer filed Oct. 28, 1975, by the assignee, *Storage Technology Corporation.*

Hereby enters this disclaimer to claims 12–14 of said patent.

3,775,775.—*Anthony Mazzenga*, Commack, N.Y. DESIGN CODING FOR COORDINATED GARMENT SETS. Patent dated Dec. 4, 1973. Disclaimer filed Sept. 3, 1975, by the assignee, *Garan, Incorporated.*

Hereby enters this disclaimer to claims 1–5 of said patent.

3,786,251.—*Donald H. Kylin* and *Thomas E. Reim*, Cleveland Heights, Ohio. BULK MATERIAL NUCLEAR MOISTURE GAUGING SYSTEM. Patent dated Jan. 15, 1974. Disclaimer filed Oct. 2, 1975, by the assignee, *Republic Steel Corporation.*

Hereby enters this disclaimer to all claims of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 8, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-3-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-3-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-9-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-22-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-3-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	4-16-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-13-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-10-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-25-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-6-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-18-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-14-75

Expiration of patents: The patents within the range of numbers indicated below expire during December 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,862,205 to 2,866,972 inclusive
Plant Patents..... Numbers 1,775 to 1,791 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 2, 1975

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T941,001

COATING COMPOSITIONS

Charles Lee Corpening, Rte. 16, 5912 Sue St. 37663, and Theron Edward Parsons III, 4145 Skyland Drive 37664, both of Kingsport, Tenn.

Filed June 17, 1974, Ser. No. 480,444

Int. Cl. C08b *21/32*
U.S. Cl. 260—17 R

No Drawing. 6 Pages Specification

Nonaqueous dispersions of acrylic thermosetting resins are modified with a compatible cellulose acetate butyrate to provide coating compositions having improved flow out and pigment control. The cellulose acetate butyrate has a butyryl content of from about 35 to 55% by weight, a hydroxyl content of from about 0.2 to about 5% by weight, an acetyl content of less than 3% and a viscosity of from about 0.001 to about 0.015 seconds. The cellulose acetate butyrate is dissolved in a solvent and mixed with the nonaqueous dispersion so that the cellulose acetate butyrate is present in an amount of from about 0.1 to about 20% by weight, based on the weight of the solids in the nonaqueous dispersion.

T941,002

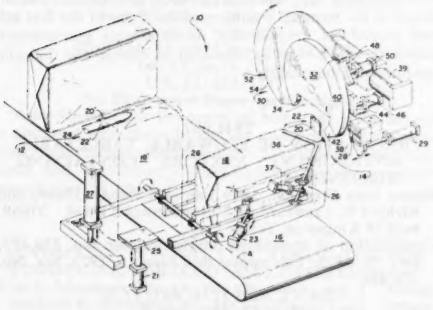
APPARATUS FOR AUTOMATICALLY SEALING VALVE BAGS

Merton L. Dibble, Rte. 13, Kingsport, Tenn. 37664

Filed June 28, 1974, Ser. No. 484,363

Int. Cl. B65b *51/24, 63/00*
U.S. Cl. 53—124 A

1 Sheet Drawing. 11 Pages Specification



The apparatus automatically seals a valve bag that is enclosed at the top, bottom and on all sides except for a flexible valve sleeve that extends parallel to and along the bag top and into which a filling spout is inserted. The apparatus includes a lifting member for lifting a filled valve bag to a predetermined extent to take the weight of the bag off the filling spout; clamping arms for clamping and supporting the filled valve bag in its vertical upright filling position and then for pivoting the bag to a horizontal position; a wiper device for wiping across the uppermost side of the valve bag in its horizontal position and to move against the flexible valve sleeve to flatten both; an adhesive applicator for applying adhesive to a portion of the bag top adjacent the valve sleeve; a rotary turret; a heating device on the rotary turret for heating the adhesive impregnated interior portions of the valve sleeve; a clamping arrangement on the rotary turret for sealing the valve sleeve together; a folding member on the turret for folding the valve sleeve back over itself and against the adhesived portion of the bag top; and a holding portion on the folding member for holding the valve sleeve against the bag top until sealed thereto.

T941,003

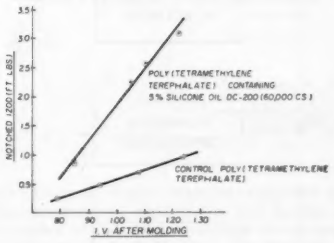
POLYESTER THERMOPLASTIC MOLDABLE COMPOSITIONS CAPABLE OF BEING MOLDED INTO OBJECTS HAVING IMPROVED PHYSICAL PROPERTIES

Thomas G. Davis, 1620 Pineola Ave. 37664, and John G. Thompson, 614 Lazy Lane 37663, both of Kingsport, Tenn.

Filed July 30, 1974, Ser. No. 493,008

Int. Cl. C08g *17/14*
U.S. Cl. 260—75 SB

1 Sheet Drawing. 7 Pages Specification

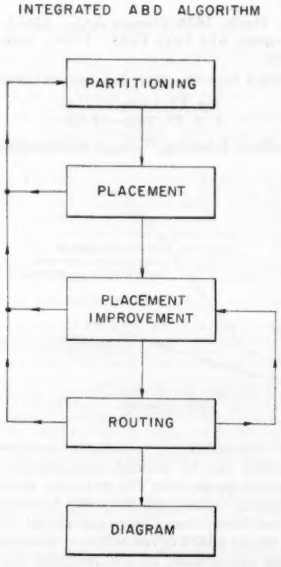


Polyester thermoplastic moldable compositions are provided which can be molded into objects having improved physical properties. The polyester moldable compositions contain at least one polyester thermoplastic material and at least one silicon compound. The silicon compound can be added to the polyester thermoplastic material during preparation of the polyester thermoplastic material or the silicon compound can be added by melt blending to the prepared thermoplastic material. The silicon compound containing polyester thermoplastic composition can be molded into objects which exhibit improved physical properties. One such improved property exhibited by the molded object is an improved Izod impack strength.

T941,004
REACTIVE FILLERS FOR UNSATURATED RESINS
Clarence C. Dannelly, Rte. 8, Cochise Trail, Kingsport, Tenn. 37664
Filed Aug. 1, 1974, Ser. No. 494,020
Int. Cl. C08f *43/08*
U.S. Cl. 260—862
No Drawing. 9 Pages Specification

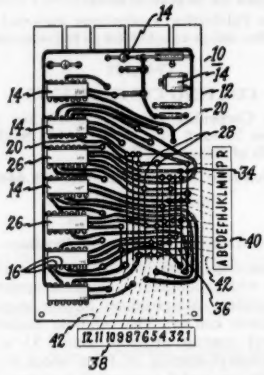
Particulate substances containing polymerizable olefinic unsaturation useful as reactive fillers for resins which achieve final form and useful properties by polymerization of olefinic unsaturation. The reactive fillers are particularly useful as modifiers for unsaturated polyester resins. In this application, the reactive fillers can be used during formation of a shaped article, impart special physical properties such as improved impact resistance, impart improved dimensional stability, and impart improved appearance. The reactive fillers are made by polymerizing substances or mixtures which contain more than one type of olefinic unsaturation, at least one of which can form copolymers but will not form homopolymers under the reaction conditions used to make the filler and wherein a part of this type of unsaturation remains in the reactive filler material and is available for subsequent polymerization reactions.

T941,005
AUTOMATED BLOCK DIAGRAMMING SYSTEM
Jean Davies Lesser, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 20, 1974, Ser. No. 499,109
Int. Cl. G06f *9/12*
U.S. Cl. 444—1
21 Sheets Drawing. 37 Pages Specification



This is a system for accepting the specification of the elements of a block graph which are introduced as input to a computer system and automatically producing paginated block diagrams as output. A set of heuristic procedures are used in this system, which results in an integrated, interactive relationship between the partitioning, placement and line routing functions.

T941,006
ELECTRICAL IMPULSE DIVIDER MODULE WITH PRINTED CIRCUIT INTERCONNECT MATRIX
Richard G. Farnsworth, York, Maine, assignor to General Electric Company
Continuation of application Ser. No. 366,555, June 4, 1973. This application Aug. 23, 1974, Ser. No. 500,157
Int. Cl. H05k *5/00*
U.S. Cl. 317—101 R
2 Sheets Drawing. 9 Pages Specification



A divider circuit module for an electrical impulse totalizer is provided with an interconnect matrix including removable pins which may be rearranged to change the particular division operation of the module. The module comprises a first set of conducting strips on one side of the circuit board, the strips of the first set being connected at one end to one or more terminals of the components and having unconnected terminal locations arranged in a matrix configuration, and a second set of conducting strips on the other side of the circuit board, the strips of the second set having unconnected terminal locations arranged adjacent to, but insulated from, certain of the terminal locations of the strips of the first set. The terminal locations of the strips of the first set are disposed at a location directly opposite the terminal locations of the strips of the second set and an aperture is provided through the circuit board and through the directly opposite such terminal locations. Conductive pins extend through the apertures and are soldered on each side of the circuit board to the terminal locations of the strips of the first set and second set, respectively, as removable interconnect members which may be relocated to change the division operation of the module.

T941,007
PREPARATION OF FLOWABLE, TABLETABLE ANTIOXIDANT MIXTURE CONTAINING SILICONES
Emma Jean Freeman, 1849 Fairoaks Road 37664, and Richard R. Crawford, 512 Brandonwood Road 37660, both of Kingsport, Tenn.
Continuation of abandoned application Ser. No. 270,425, July 10, 1972. This application June 15, 1973, Ser. No. 370,492
Int. Cl. A23l *3/34*; B01j *1/16*
U.S. Cl. 252—400 R
No Drawing. 11 Pages Specification

A flowable, tabletable mixture containing a silicone, an antioxidant, and an organic acid is prepared by forming a blend of the materials in a molten state, allowing the blend to cool and recrystallize while it is being vigorously stirred resulting in a crystalline particulate material which can be formed into tablets. These antioxidant

tablets are available for addition to cooking oils and the like and especially oil utilized in deep-fat frying to inhibit the development of rancidity.

T941,008
PROCESS FOR PREPARING A POLYESTER FABRIC HAVING DESIRABLE STAIN-RELEASE, ANTI-SOIL-REDEPOSITION, ANTISTATIC AND HYDROPHILIC PROPERTIES

Robert B. Barbee, Rte. 3, Tinker Lane, Kingsport, Tenn. 37664

Filed Aug. 27, 1973, Ser. No. 391,729
Int. Cl. D06m *15/14, 15/36*
U.S. Cl. 8—115.5
No Drawing. 3 Pages Specification

Disclosed is a process for preparing fabrics which exhibit desirable stain-release, antisoil-redeposition, antistatic and hydrophilic properties. According to this process, a fabric comprised of poly(1,4-cyclohexylenedimethylene terephthalate) fiber is contacted with acrylic acid and a free radical initiator under grafting reaction conditions.

T941,009
FORMATION OF MICRODISCONTINUOUS CHROMIUM

Donald L. Snyder, Solon, and Arthur H. Du Rose, Richmond Heights, Ohio, assignors to Kewanee Oil Company, Bryn Mawr, Pa.

Filed Dec. 20, 1973, Ser. No. 426,765
Int. Cl. B32b *15/00;* **C23b** *5/50*
U.S. Cl. 29—194
No Drawing. 20 Pages Specification

A method is described for producing a microporous chromium electrodeposit on a basis metal of nickel, cobalt, or an alloy containing one or both, by depositing electrically conductive metallic particles on the basis metal. The fine particles may be grown directly on the surface of the basis metal by plating from an electroplating bath, by immersion coating from an aqueous solution, or by the reduction from an electroless bath. In each case, the ions of the metallic particles to be deposited are present in the bath. Alternatively, the metal particles are deposited on the basis metal in a strike layer from an electroplating bath containing the particles in finely divided form. The basis metal, containing the discrete fine particles, is then plated with a thin layer of chromium in a conventional manner to yield a microporous chromium deposit.

T941,010
ANTHELMINTIC METHOD OF TREATMENT

Jack Blodinger, 16 Bell Drive, Westfield, N.J. 07090

Filed Feb. 15, 1974, Ser. No. 443,064
Int. Cl. A61k *27/00*
U.S. Cl. 424—217
No Drawing. 4 Pages Specification

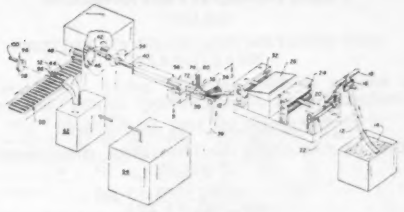
A method for the treatment of helminths in mammals is disclosed whereby substantially concurrent administration 5-isopropoxycarbonylamino - 2 - thiazolyl benzimidazole and O,O-dimethyl-2,2,2-trichloro-1-hydroxy ethylphosphonate is effected.

T941,011
AUTOMATIC CONTROLLED APPARATUS FOR PRODUCING TOBACCO SMOKE FILTER RODS

Kyle E. Morrison, Rte. 15, 936 Chadwick, Apt. 3 37660; Richard E. Bevington, Jr., 2112 Tallwood Lane 37660; and Robert E. Duram, Rte. 9, Mere Vista 37663, all of Kingsport, Tenn.

Filed May 6, 1974, Ser. No. 467,524
Int. Cl. B29d *23/00*
U.S. Cl. 93—1 C
2 Sheets Drawing. 20 Pages Specification

In apparatus for producing tobacco smoke filter rods from a continuous length of banded filter tow and having a set of tension rolls, a set of feed rolls, a plasticizer application device for applying plasticizer to the banded filter tow, a set of delivery rolls, a collecting trumpet for initiating condensing of the banded filter tow toward a rod-like configuration, a folder tongue immediately adjacent the collecting trumpet for further condensing the banded filter tow to the rod-like configuration, a garniture device in which the filter tow is moved and wrapped, a severing device, and conveyors for conveying the severed filter rods away from the apparatus, the improvement comprising an air sensing device connected to the folder tongue for sensing resistance to flow of air through the

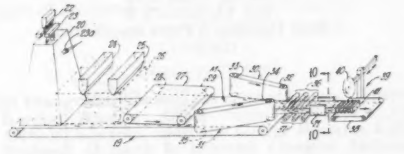


filter tow passing through the folder tongue and for generating a signal proportional to the density of the tow passing through the folder tongue. The signal generated is compared with a voltage set-point which represents a predetermined pressure drop, hence predetermined density of filter tow, and should the generated signals compared differ from the voltage setpoint, the delivery rolls, feed rolls and tension rolls are either slowed or speeded up relative to the speed of the filter tow moving through the garniture device so as to cause either a greater or less amount of filter tow to be fed into the folder tongue.

T941,012
FRICTION MATERIAL INCLUDING GLASS FIBERS AND METHOD OF MANUFACTURE

Alfred Marzocchi, 35 Thomas Leighton Blvd., Cumberland, R.I. 02864

Filed July 26, 1974, Ser. No. 483,193
Int. Cl. C03b *37/02;* **F16d** *69/02*
U.S. Cl. 65—3
2 Sheets Drawing. 27 Pages Specification



A brake lining or friction material comprised of glass fibers secured within a rigid binder and having a substantial number of ends of convolutions intersecting with the braking surface of the material. The material preferably comprises a plurality of bonded fibers generally extending in a common direction and intersecting with said braking surface. The fiber alignment may be positioned relative to the direction of relative movement of the braking members for optimum braking efficiency in one direction. Such aligned fiber materials may be produced in a continuous process in the form of uncured blocks of aligned fibers and binder which are subsequently formed under elevated pressure and temperature into brake pads or shoes or other friction components. Brake pads having aligned or oriented fibers may be produced in a continuous process, starting with the forming of glass fibers from a molten batch, depositing a ribbon of aligned fibers upon a moving conveyor, applying liquid or powdered binder to the fibers, reducing the lateral and vertical

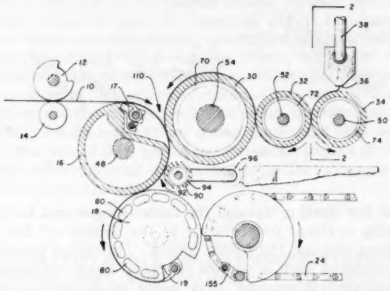
volume of the ribbon to increase the density of the fiber-binder mix and finally separating the ribbon into shapes having a surface which intersects the aligned fibers.

T941,013
COATING MACHINE AND METHOD

James E. Huffaker, 1117 Radcliffe Drive 37664, and Ted L. Douglas, Rte. 11 37663, both of Kingsport, Tenn.

Continuation of abandoned application Ser. No. 265,071, June 21, 1972. This application Sept. 3. 1974, Ser. No. 502,574

Int. Cl. B05c *1/02*
U.S. Cl. 118—60
3 Sheets Drawing. 10 Pages Specification



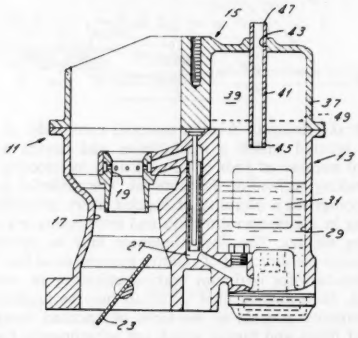
Improved apparatus and method for the application of thin coatings of thermoplastic material to sheets of material being advanced in succession. Sheets are carried by impression roll **16** post applicator roll **30**, heated smoothing means **90**, to cooling roll **18**. Molten material is supplied from nozzle **36** to roll **34** which feeds the material to applicator **30**.

T941,014
SPILL-PROOF VENTED ENCLOSURE

William W. Charron, 3830 McDivitt, Orchard Lake, Mich. 48033, and Max W. Lunsford, 23125 Berg Road, Southfield, Mich. 48075

Continuation-in-part of abandoned application Ser. No. 345,167, Mar. 26, 1973. This application Sept. 5, 1974, Ser. No. 503,533

Int. Cl. F02m *5/02*
U.S. Cl. 261—72 R
1 Sheet Drawing. 5 Pages Specification



A spill-proof vented enclosure suitable for use as a fuel bowl of an internal combustion engine carburetor. The bowl or enclosure includes an enlarged vapor dome having a depending vent tube. The inlet to the vent tube within the bowl is centrally located within the enclosure and remains above the fuel level irrespective of the position of the carburetor relative to the horizontal.

T941,015
WOVEN FABRIC HAVING UNIFORM AIR PERMEABILITY AND FORMING PROCESS

Clifford Hoyle and Lewis Charles Huskilson, Kingston, Ontario, Canada, assignors to Du Pont of Canada Limited, Montreal, Quebec, Canada

Continuation of abandoned application Ser. No. 347,550, Apr. 4, 1973. This application Sept. 30, 1974, Ser. No. 511,027

Int. Cl. D03d *15/00*
U.S. Cl. 139—420
No Drawing. 9 Pages Specification

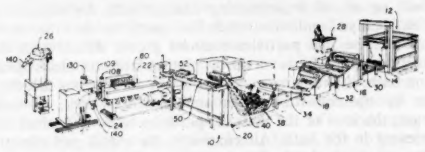
An uncoated woven fabric of heat-shrinkable synthetic thermoplastic yarn having a very low air permeability is disclosed. The process for making the fabric comprises weaving as tightly as practical, on a commercial basis the synthetic thermoplastic yarn (preferably a multifilament interlaced nylon yarn having substantially zero bundle twist) into a fabric; and heating the fabric under substantially no tension (preferably on a tenter frame) to a temperature approaching the melting point of the yarn.

T941,016
WASTE RECOVERY OF THERMOPLASTIC CONTINUOUS FILAMENTARY MATERIAL

Robert Hester, 2100 Montrose Ave. 37664, and Howard Paul Pierson, 120 Tall Oaks Court 37663, both of Kingsport, Tenn.

Continuation of abandoned application Ser. No. 285,974, Sept. 5, 1972, which is a division of application Ser. No. 67,324, Aug. 27, 1970, now Patent No. 3,703,347. This application Oct. 15, 1974, Ser. No. 514,528

Int. Cl. B29b *1/00;* **B29c** *29/00;* **B29f** *3/00*
U.S. Cl. 264—142
8 Sheets Drawing. 20 Pages Specification



Method for recovering waste thermoplastic fiber of continuous length filamentary material and converting it into reuseable feed stock and particularly a large, otherwise unmanageable, entangled mass of continuous length filamentary material, some or all of which being either drafted or undrafted, wherein the continuous length filamentary material is converted into random length staple fiber by compressing the entangled mass of waste thermoplastic fiber into a mass of predetermined size, converting the compressed mass into staple fiber by cutting the compressed mass into predetermined sections and then cutting the sections into the staple fiber of random length, the random length staple fiber is then mechanically compacted and melted into a melt flow, and the melt flow is finally extruded as the reuseable feed stock.

T941,017
BENZAZOCINES AS LOCAL ANESTHETICS

John Edgar Giering, West Bloomfield, N.Y., John Alan Beech, Talahassee, Fla., and George Camougis, Worcester, Mass., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of application Ser. No. 427,271, Dec. 21, 1973, which is a continuation of application Ser. No. 14,211, Feb. 24, 1970, both now abandoned. This application Nov. 6, 1974, Ser. No. 521,325

Int. Cls. A61k *31/135, 31/445*
U.S. Cl. 424—267
No Drawing. 19 Pages Specification

The use of pentazocine, cyclazocine and similar 1,2,3,4,5,6 - hexahydro - 2,6 - methano - 3 - benzazocine derivatives as local anesthetics, and compositions containing said compounds and epinephrine.

T941,018

PROCESS FOR THE PRODUCTION OF SHAPED ARTICLES

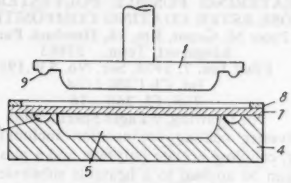
Kenneth Clarke, Knebworth, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 16, 1974, Ser. No. 506,543

Claims priority, application Great Britain, Sept. 20, 1973, 44,132/73; Nov. 23, 1973, 54,386/73

Int. Cl. B29c *27/06*
U.S. Cl. 156—69

5 Sheets Drawing. 22 Pages Specification



Shaped articles, such as food trays and the like, are produced by cold-forming polyester, especially oriented polyethylene terephthalate, films below the polyester glass transition temperature, heat setting and quenching. Slight relaxation at the heat setting temperature may be effected to improve dimensional stability. Short cycling times can be achieved by using a cold-forming punch of low thermal capacity, for instance a shaped copper sheet, through which the shaped film is heated while held in the deformed condition. Lids may be applied to the shaped articles by melt adhesives. Food containers so formed are suitable for heating in both conventional and microwave ovens.

T941,019

POWER TOOL

Ernst Kränzler, Stetten, Filder, and Gerhard Kuhlmann, Suttgart, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

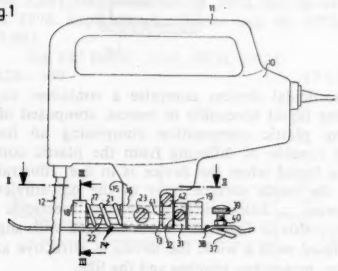
Filed Oct. 17, 1974, Ser. No. 515,711

Claims priority, application Germany, Oct. 27, 1973, G 73 38 651.3

Int. Cl. B27b *11/02*
U.S. Cl. 30—376

3 Sheets Drawing. 16 Pages Specification

Fig.1



A power tool, e.g., a saber saw, has a base plate which is to be placed onto a workpiece. The tool body, including a housing, a drive, a tool and other components, is mounted on the base plate for arrestable displacement relative to the base plate to a limited extent so that, even though it may not be possible to move the base relative to the workpiece, e.g., because an edge or surface of the workpiece prevents this, the tool body can be moved relative to the base plate. The tool body may be mounted for relative movement in the longitudinal direction of the base plate and/or for swiveling movement in transverse direction. Further, the tool body may also be mounted to be arrestably pivotable relative to the base plate about a horizontal axis, to permit the angle included between the tool (e.g., a sawblade) and the workpiece surface to be varied. The base plate may be releasably connected with the tool body and a narrow base plate may additionally be furnished which can be connected with the tool body when it is desired to be able to insert the base plate in its entirety into a groove.

T941,020

POLYOLEFIN FILMS AND METHODS FOR MAKING SAME

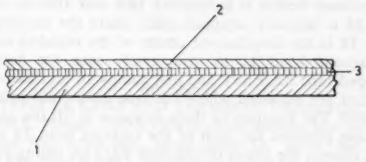
Roger Neville Young, Chesham, England, assignor to Imperial Chemical Industry Limited, London, England

Filed Nov. 13, 1974, Ser. No. 523,530

Claims priority, application Great Britain, Dec. 21, 1973, 59,338/73

Int. Cl. B32b *27/30, 27/32*
U.S. Cl. 428—349

1 Sheet Drawing. 21 Pages Specification



A heat sealable film for use in packaging comprising a polyolefin film substrate at least one surface of which is coated with a layer of a heat sealable material, wherein the film substrate is formed from a composition comprising a blend of from 87.5 to 60 parts by weight of polypropylene and from 12.5 to 40 parts by weight of a block copolymer of ethylene and propylene, the copolymer containing from 0.5 to 40% by weight of ethylene, based on the weight of the copolymer, and the blend containing from 0.2 to 5% by weight of ethylene, based on the weight of the blend.

T941,021

VOIDED FILMS

Carl Fraser Mathews and Christopher Deverell, Hitchin, Gordon Edmund Alfred Pears, Harpenden, Alan Duffield, Kimpton, and Peter George Knowles, Luton, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of abandoned application Ser. No. 407,950, Oct. 19, 1973. This application Dec. 9, 1974, Ser. No. 531,000

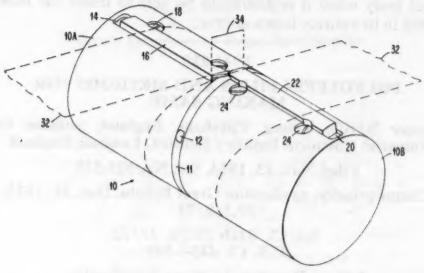
Claims priority, application Great Britain, Feb. 9, 1973, 6,396/73

Int. Cl. G03c *1/78, 1/96*
U.S. Cl. 96—87 R

No Drawing. 18 Pages Specification

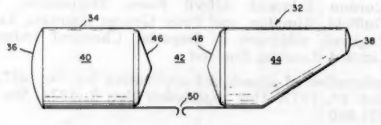
Opaque voided films having a total luminous transmission not exceeding 25% are made from blends of a polyester preferably polyethylene terephthalate, with 3 to 27% of an ethylene or propylene polymer, prepared by dry blending. The films are prepared by blending particles of the polyester and polymer, and then extruding the blend as a film, quenching, biaxially orienting the film and heat setting. The opacity is the result of voiding which occurs during the stretching operation. The voided film may be used as a base for photographic prints.

T941,022
APPARATUS FOR LIFTING TAPE EDGES ABOVE PATH OF ROTATING HEAD
Frederic F. Freeman, Boulder County, and Ernest P. Kollar, Weld County, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 23, 1974, Ser. No. 535,407
Int. Cl. G11b *15/60*
U.S. Cl. 360—130
2 Sheets Drawing. 6 Pages Specification



Disclosed herein is a mandrel **10A** and **10B** on which tape **32** is helically wrapped 360° about the mandrel. A rotor **11** in the longitudinal center of the mandrel carries a magnetic head **12** to transversely scan the helically wrapped tape **32**. Entry and exit ramps **16** and **22** on the mandrel are provided where the tape enters and exits the mandrel. The function of these ramps is to lift the edge of the tape adjacent the path of the rotating head **12** as the head crosses the edges of the tape **32**. This lifting by the ramps prevents the head from striking the edges of the tape and thus damaging the head and the tape. Both the ramps and the mandrel are made from porous material so as to be air bearing.

T941,023
BULKHEAD ARRANGEMENT FOR INFLATABLE APPARATUS AND FABRICATION METHOD
Randall F. White, Bricktown, N.J., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Dec. 23, 1974, Ser. No. 535,894
Int. Cl. B63b *35/34*
U.S. Cl. 114—5 F
2 Sheets Drawing. 17 Pages Specification

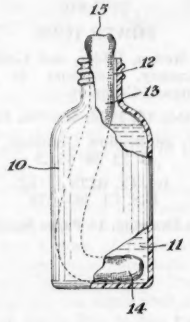


A bulkhead is disclosed for use in multi-celled inflatable apparatus such as helicopter floats and the like. The bulkhead is fabricated of a thin walled limp impervious material so that it may be easily folded, and is constructed to assure integrity of seal of the bulkhead edge to the inflatable wall. Also, when an individual compartment is breached, the bulkhead is designed to assure minimum change of fluid pressure and volume in those unbreached compartments remaining on either side of the breached compartment. The bulkhead is fabricated in a substantially dish-shaped configuration having a shallow bowl portion rimmed by a substantially steep sided edge portion of relatively short length compared to the span of the bowl portion. The bowl portion is configured as a frustum of a cone with an acute vertex angle.

T941,024
NON-CRATERING FUSIBLE POLYESTER CELLULOSE ESTER COATING COMPOSITION
Peter M. Grant, Rte. 16, Hemlock Park, Kingsport, Tenn. 37663
Filed Jan. 7, 1975, Ser. No. 539,192
Int. Cl. C08l *1/14*
U.S. Cl. 260—16
No Drawing. 9 Pages Specification

A polyester coating composition including a linear polyester, cellulose acetate butyrate, and a plasticizer. The coating can be applied to a heatable substrate in powder form and caused to fuse by application of heat to produce a smooth, non-cratered surface.

T941,025
INSECTICIDAL DEVICE
Frank H. Dowell, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.
Filed Jan. 17, 1975, Ser. No. 541,817
Int. Cl. A24f *25/00*; A61l *9/04*
U.S. Cl. 239—44
1 Sheet Drawing. 15 Pages Specification



Insecticidal devices comprise a container, capable of holding liquid accessible to insects, composed of or containing plastic composition comprising an insecticidal agent capable of diffusing from the plastic composition to the liquid when the device is in use. Illustratively, at least the inside surface layer of the polyethylene bottle comprises a halopyridyl phosphate insecticide such as chlorpyrifos or fospirate; when charged with sugar water and fitted with a wick, the device is attractive and lethal to flies, mosquitos, roaches and the like.

REISSUES

DECEMBER 2, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

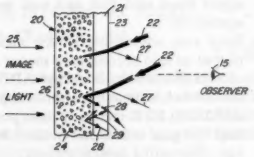
Re. 28,634
REAR PROJECTION SCREEN

James J. DePalma, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,655,262, dated Apr. 11, 1972, Ser. No. 69,863, Sept. 4, 1970. Application for reissue Mar. 25, 1974, Ser. No. 454,514

Int. Cl. G03b *21/60*

U.S. Cl. 350—126 14 Claims



1. A screen material for transmission type projection screens having color quality and ambient light control comprising a dispersion of a generally clear carrier medium, fine particles of chlorinated diphenyl resin and a plurality of light absorbing dyes of [different] *blue, light red, yellow and orange* color.

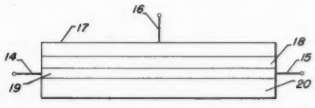
Re. 28,635
PYROPOLYMERIC SEMICONDUCTING ORGANIC-REFRACTORY OXIDE MATERIAL

Karl J. Youtsey, Chicago; William C. Holt, Jr., Prospect Heights; Robert D. Carnahan, Barrington, and David H. Spielberg, Schaumburg, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Original No. 3,651,386, dated Mar. 21, 1972, Ser. No. 66,521, Aug. 24, 1970. Application for reissue Aug. 16, 1973, Ser. No. 389,051

Int. Cl.² H01C *17/20;* H01L *29/28*

U.S. Cl. 428—409 17 Claims



[1. In a semiconducting device, a semiconducting material therefor comprising a refractory oxide having a surface area of from about 1 to about 500 square meters per gram and a carbonaceous pyropolymer forming at least a monolayer on said refractory oxide, said semiconducting material having a conductivity at room temperature of from about 10^{-8} to about 10^{0} inverse ohm-centimeters.]

8. The semiconducting material of claim 7 wherein said metals are platinum and rhenium.

Re. 28,636
ANTIBACTERIAL COMPOSITION CONTAINING 5-METHYL-3-SULFANILAMIDOISOXAZOLE AND TRIMETHOXYBENYL PYRIMIDINE

Emanuel Grunberg, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Original No. 3,515,783, dated June 2, 1970, Ser. No. 676,700, Oct. 20, 1967. Application for reissue Jan. 28, 1974, Ser. No. 437,577

Int. Cl.² A61K *31/505*

U.S. Cl. 424—229 2 Claims

[1. A therapuetic antibacterial composition effective in the treatment of sulfamethoxazole resistant bacterial infections comprising from about 1 to about 30 parts of a sulfonamide selected from the group consisting of 5-methyl-3-sulfanilamidoisoxazole and alkali metal salts thereof with pharmaceutically acceptable bases and one part of a pyrimidine selected from the group consisting of 2,4-diamino-5-(3,4,5-trimethoxybenzyl) pryimidine and salts thereof with pharmaceutically acceptable acids.]

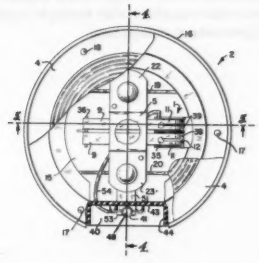
Re. 28,637
VEHICLE LAMP AND TERMINAL THEREFOR

Kenneth C. Ploeger, 705 S. 10th St., Blue Springs, Mo. 64015

Original No. 3,739,168, dated June 12, 1973, Ser. No. 250,876, May 8, 1972. Application for reissue May 6, 1974, Ser. No. 467,193

Int. Cl.² B60Q *1/00, 1/30*

U.S. Cl. 240—7.1 R 7 Claims



10. A vehicle lamp structure comprising:

(a) a housing with a base wall and a side wall defining an open end compartment closed by a lens;

(b) a lamp support mounted in said housing, said lamp support having a socket member with a socket for receiving a lamp base in electrical contact and having an open end through which an end contact of the lamp base extends, said lamp support having at least one leg extending from the socket member to adjacent said base wall of the housing;

(c) means securing said leg of said lamp support to said base wall of the housing to position a lamp in the socket for directing light through the lens;

(d) wall members upstanding on the base wall toward said socket member and positioned on opposite sides of said socket member, said wall members terminating in ends;

(e) a terminal member mounted on said ends of the upstanding wall members and having a resilient portion extending therebetween and under portions of said socket member for electrical engagement with a lamp contact of a lamp therein, said terminal member having one end thereof

secured to one of said upstanding wall members and the other end engaging the other said upstanding wall member, and said terminal member being deflected by engagement of the lamp contact whereby said terminal member resiliently maintains said engagement; and

(f) means for effecting electrical connection of said terminal member and said socket member to a source of electrical power.

Re. 28,638

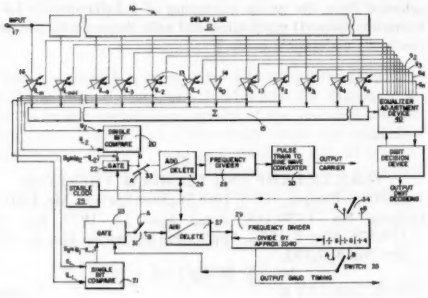
HIGH SPEED TRANSMISSION RECEIVER UTILIZING FINE RECEIVER TIMING AND CARRIER PHASE RECOVERY

Earl D. Gibson, Huntington Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Original No. 3,694,752, dated Sept. 26, 1972, Ser. No. 125,660, Mar. 18, 1971. Application for reissue Sept. 25, 1974, Ser. No. 508,927

Int. Cl.² H04B *1/10*

U.S. Cl. 325—323 **5 Claims**



1. In combination with a high speed digital data receiver having a transversal equalizer with multiple adjustable attenuators, the improvement comprising:

a first comparator connected to the output of at least two adjustable attenuators of said equalizer, said first comparator providing an output signal corresponding to the sign of the difference between the gains at said two adjustable attenuators of said equalizer [, said first comparator providing an output signal corresponding to the sign of the difference between the gains at said two adjustable attenuators];

a second comparator connected to the output of at least two other of the adjustable attenuators of said equalizer, said second comparator providing an output signal corresponding to the sign of the difference between the gains at said other two adjustable attenuators;

a clock means for providing a train of clock pulses;

a first and a second ADD/DELETE means receiving as an input said train of clock pulses;

first and second gate means connected to receive the output signal from said first and said second comparators, respectively;

a fixed rate alternating switch means for connecting the output of said second gate means alternately to the input of said first and said second ADD/DELETE means;

a first switch means for connecting the input of said first ADD/DELETE means in one position to the output of said first gate means and in the other position to said fixed rate alternating switch means;

first and second frequency divider means connected to receive the output from said first and said second ADD-/DELETE means, respectively, the output of said first frequency divider means being a train of pulses that are proportional to the output carrier with the output of said second frequency divider being a train of pulses proportional to the output baud timing; and

two feedback means for connecting selected outputs from said second frequency divider means back to said first and said second gate means so as to control the time intervals at which said first and said second ADD-/DELETE means add or delete pulses to the pulse trains entering said first and said second frequency dividers, thereby controlling the time intervals between consecutive incremental adjustments of the output carrier phase and the output baud timing.

PLANT PATENTS

GRANTED DECEMBER 2, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,812

CHRYSANTHEMUM (INDEPENDENCE)

Leonard H. Shoesmith, Westfield, Woking, Surrey, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,427

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—77 1 Claim

1. A new and distinct variety of chrysanthemum, substantially as herein shown and described, characterized by the very large size and pure white color of its blooms, its semi-incurve flower form with many broadly spooned ray florets, and its resistance to pinking.

3,813

CHRYSANTHEMUM PLANT (SPIRIT)

Leonard H. Shoesmith, Westfield, Woking, Surrey, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,428

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—77 1 Claim

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized by the pure white of its relatively large flowers of the decorative type, by the soft golden glow that appears from the base of the immature florets at and around the center of the bloom until the bloom reaches full maturity, and by its many tubular and spooned ray florets.

PATENTS

GRANTED DECEMBER 2, 1975

ERRATA

For CLASS	See PATENT NO.
101–382 MV	3,922,772
254–135 R	3,923,171
280–124 F	3,923,240
274–023 R	3,923,309
259–099	3,923,679
264–005	3,923,933
427–084	3,923,975
424–258	3,924,042
178–022	3,924,074
343–006 R	3,924,232
343–006 R	3,924,233
343–007 PF	3,924,234
343–007.4	3,924,235
343–016 R	3,924,236
343–786	3,924,237
343–807	3,924,238
343–909	3,924,239
346–172.5	3,924,270

PATENTS

GRANTED DECEMBER 2, 1975

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,922,721

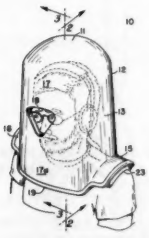
WEARABLE SOUND ATTENUATING ENCLOSURE

Robert S. Gales, San Diego, and Robert S. Harrah, La Jolla, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 20, 1974, Ser. No. 507,825

Int. Cl.² G10K *11/04*

U.S. Cl. 2—2 R **3 Claims**



1. An apparatus for ensuring a high degree of acoustic isolation from impinging noise in a high noise environment comprising:

a rigid shell having a dome-shaped top portion, downwardly reaching front, back and side portions and a pair of shoulder portions each outwardly extending from a separate one of the side portions, all the portions are integrally formed, shaped with rounded contours which are dimensioned to define a cavity for enclosing the head, neck and upper thorax in a spaced relationship; and the front portion is provided with an opening for permitting visual and oral communication, yet being of a small enough size so as not to overly compromise ambient noise attenuation; at least one layer of a sound absorbing material mounted on the inner surfaces of the aforestated portions; and

means carried on the mouth of the cavity between the shell and the shoulders, the chest and the back for sealing the cavity shut except for the small opening in the front portion for sealing out impinging noise when said apparatus is placed to enclose the head, neck and upper thorax, the rigid shell, sound absorbing layer and sealing means are selected from materials which are sufficiently lightweight to permit portability and which acoustically cooperate to provide a ten db ambient noise attenuation.

3,922,722

DEVICE FOR PROTECTIVE OPERATOR'S RESPIRATORY ORGANS AGAINST AEROSOLS

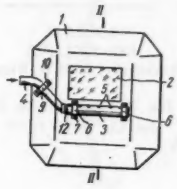
Igor Konstantinovich Pokhodnya, Mechnikova, 3, kv. 21; Igor Mikhailovich Naumenko, ulitsa Sosninykh, 6, kv. 54, and Vladimir Nikolaevich Golovko, ulitsa Vladimirskaya, 9, kv. 29, all of Kiev, U.S.S.R.

Continuation of Ser. No. 423,305, Dec. 10, 1973, abandoned. This application Dec. 19, 1974, Ser. No. 534,308

Int. Cl.² A42B *1/00*

U.S. Cl. 2—8 **2 Claims**

1. A device for protecting the operator's respiratory organs against detrimental aerosols while breathing ambient air, comprising, in combination: a protective housing provided with a light filter and a perforated pipe having an end connected to a compressed air duct, characterised in that the perforated pipe is located on the outside of the housing under the light filter, has a length equal, at least, to that of the light filter, and is closed at another end thereof so as to blow the



aerosols up and away from the housing to prevent inhalation thereof.

3,922,723

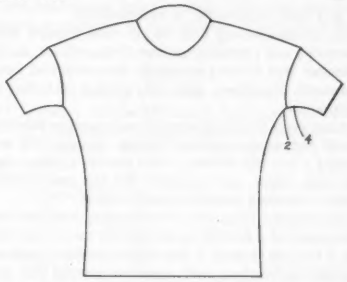
METHODS AND ARTICLES FOR DEODORIZING USING ION EXCHANGE MANUFACTURE

Karel Popper, 95 Paraiso Court, Danville, Calif. 94526

Continuation-in-part of Ser. No. 106,610, Jan. 14, 1971, abandoned. This application July 24, 1973, Ser. No. 382,208

Int. Cl.² A41B *9/06*; A61K *7/32*

U.S. Cl. 2—113 **6 Claims**



1. A deodorant manufacture configured into a shaped article constituting a garment comprising anion exchange material, said garment being so fabricated and customarily so worn that its anion exchange material contacts odorant from a region of the body that commonly exudes an odor relatively strongly noticeable to humans;

said anion exchange material comprising weak base anion exchange fabric;

said anion exchange material being in non-fluid and essentially nondispersible, substantially extended form and having anion exchange sites capable of substantially sorbing anions from said odorant at the pH existing in the region of contact between said material and said odorant; any components of said material that are endowed with anion exchange sites and are grossly discernible as distinct from one another being, when considered as a group, constrained against any significant flowing so that these components as a group exhibit the characteristic of being non-fluid and essentially non-dispersible;

said garment having a body portion provided with armholes sufficiently high on said body portion so that the part of said garment adjacent to the armholes, including that region of the body portion adjacent to, and in part forming the boundary of, said armholes normally contacts the axilla of the wearer of the garment when said garment is worn by a wearer of the size of which the garment is

intended, the configuration of the garment being such that material of the garment is in contact with a substantial portion of the axilla;

the effective surface area of that portion of the garment material which contacts the axilla being sufficiently large to contact a substantial portion of the area of the axilla which exudes odorant; and

those portions of the garment which contact the axilla including anion exchange sites.

3,922,724

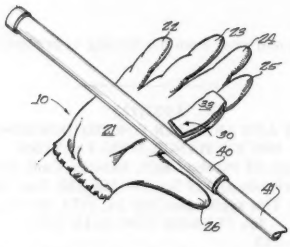
GOLF GLOVE

Michael Joseph Shockovsky, 3901 N. Ridge West, Ashtabula, Ohio 44004

Filed Dec. 3, 1974, Ser. No. 529,065

Int. Cl.[2] A41D *19/00*

U.S. Cl. 2—161 A **3 Claims**



1. A golf club comprising, in combination:

a body portion having four finger stalls formed integrally therewith and extending outwardly therefrom, and having a thumb stall formed integrally therewith and extending outwardly therefrom, said body portion including a palm portion;

a rectangularly shaped elongated pad member fabricated of a soft and supple resilient flexible compressible material having a flat top surface, a flat bottom surface, opposed flat side edges, and opposed flat top and bottom end edges extending parallel to each other;

a cover member completely surrounding said pad member fabricated of a flexible material, said cover member having a flat top surface, a flat bottom surface, opposed flat parallel side edges, and opposed parallel flat top and bottom end edges;

said pad member and its said cover member being permanently affixed along said bottom surface to the palmar side of said index finger stall with said top end edge of said pad member positioned on said index finger stall at the approximate point at which the first joint of an individual's index finger would fall when an individual was wearing said glove on his hand, said pad being of a length extending downwardly from said top edge and terminating at said bottom edge at a position adjacent the base of said index finger stall with said pad member overlapping a point of joining of an individual's index finger to an individual's palm when an individual's hand is inserted into the glove so that the pad member cushions the first metacarpus and phalanges of the individual's hand when the individual grips a hand grip portion of a golf club;

said pad member and said cover member being permanently affixed to said index finger stall by adhesive; and

said glove with said pad member providing a positive fit between an individual's gloved hand and the golf club hand grip with said pad member filling in the natural gaps which are otherwise created as a result of the contrasting soft fleshy parts of a golfer's fingers and the hard ridges of the finger knuckle joints when a hand grips the smooth rounded surface of a golf club hand grip, thus providing a greater contact area between the critical elements of the golf club hand grip and the thumb, index finger and palm portions of an individual's hand.

3,922,725

COMFORT CUSHION FOR EAR MUFFS, IN PARTICULAR SOUND SHELLS

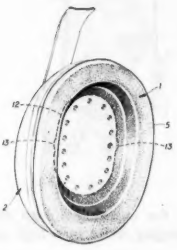
Kalman Csiki, Landskrona, and Rune Lundin, Billesholm, both of Sweden, assignors to Gullfiber AB, Billesholm, Sweden

Filed Nov. 26, 1974, Ser. No. 527,192

Claims priority, application Sweden, Dec. 21, 1973, 73174021

Int. Cl.[2] A42B *1/06*

U.S. Cl. 2—209 **6 Claims**



1. A comfort collar adapted to be mounted on an ear muff, and in particular on a muff of the sound shell type having a generally cup-shaped, rigid holder part supporting on its periphery the contact part of the shell which surrounds an ear of the user, said collar mainly comprising a soft, moisture absorbing material having thereon a first part disposed to cover the contact part of the shell surrounding the ear, and having a generally cup-shaped central part formed to fit into said cup-shaped portion of the shell and intended to receive the ear of the user, and means on the bottom of the cup-shaped part of said collar for resiliently and releasably securing said collar to the shell, the collar, when mounted on the shell during utilization thereof, preventing direct contact between the shell and the head of the user.

3,922,726

JOINT PROSTHESIS

Claudio Trentani, Via Tessitori, 5, and Sergio Sandrolini Cortesi, Via Guglielmini, 6, both of Bologna, Italy

Filed Aug. 20, 1974, Ser. No. 498,883

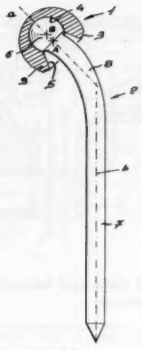
Claims priority, application Italy, Aug. 27, 1973, 3477/73

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.912 **4 Claims**

1. Hip-joint prosthesis comprising a cup member for placement in an articulating relation in an acetabulum of the pelvis, said cup member having a continuously smooth outer spherical surface and an inner spherical cavity which communicates with the outside through an opening, a femoral insert including a stem for insertion into the femoral bone after removal of the epiphysis thereof and a spheroidal head engaging said spherical cavity through said opening and articulated therein,

wherein according to the improvement said spherical cavity is eccentrically located with respect to the outer surface of the



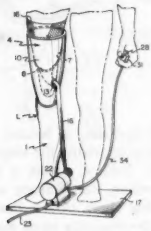
cup member so as to be displaced in a direction diametrically opposite to said opening.

3,922,727

APPARATUS TO ASSIST FASTENING OF AN ARTIFICIAL LIMB

Frank Bianco, 30-75 14th St., Long Island City, N.Y. 11102

Filed July 17, 1974, Ser. No. 489,235
Int. Cl.² A61F *1/00, 1/02*
U.S. Cl. 3—1 **4 Claims**



1. Apparatus for assisting an amputee in fitting to a stump of his amputated limb an artificial limb of the type having a cavity therein with a hole through the limb providing access to the cavity comprising:

an elongated stocking having one end passing through the hole into said cavity and adapted to fit over the end of the stump,

a reversible electric motor having an output shaft,

means on said output shaft for holding the part of the stocking extending outside of the artificial limb, said stocking being wound or unwound as said output shaft is rotated in one direction or the other,

control switch means electrically connected to said motor to control the operation and the direction of rotation of its output shaft to control the tension on the stocking to draw the stocking off the limb and through said hole of the artificial limb as the stump is fit into the cavity of the artificial limb, and

an elongated control cable electrically connected between said motor and said control switch means so that said control switch means can be held by the hand of the amputee fitting the artificial limb.

3,922,728

ARTIFICIAL CRYSTALLINE LENS

Mikhail Mikhailovich Krasnov, ulitsa Vesnina 30, kv. 12, Moscow, U.S.S.R.

Filed Aug. 15, 1974, Ser. No. 497,638
Int. Cl.² A61F *1/16, 1/24*
U.S. Cl. 3—13 **1 Claim**

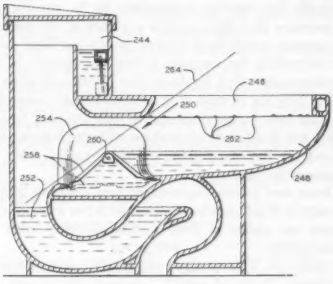
1. An artificial crystalline lens intended to be attached to the ciliary border area in the anterior chamber, outside the pupil area, said artificial crystalline lens comprising: an optical lens; a supporting leg having one end attached adjacent a peripheral edge of said lens and extending radially outwardly to a terminal free opposite end, said supporting leg having a stepped bend portion intermediate said ends which is spaced outwardly from said peripheral edge, which leg serves for the attachment of said optical lens and is intended to be introduced into a hole made in the iris outside the pupil area; and a seam receiving means for the attachment of said optical lens to the iris, said means being located at the edge of said optical lens which is opposite to the location of said supporting leg.

3,922,729

TOILET FLUSH SYSTEM

David C. Ashley, 108 DeWitt Road, Syracuse, N.Y. 13214

Filed Sept. 13, 1973, Ser. No. 396,755
Int. Cl.² A47K *17/00;* **E03D** *11/00*
U.S. Cl. 4—10 **10 Claims**



1. A toilet of the type wherein flushing water is provided to carry the bowl contents through a liquid sealed trap, said toilet comprising:

a. a bowl having an open top and a laterally disposed outlet;

b. a trap having inlet and outlet sides defined by a pipe having two vertical changes of direction, with liquid being retained to seal the trap between said inlet and outlet sides;

c. dam means between said bowl outlet and trap inlet movable between a first portion, wherein said dam means obstructs flow between said bowl outlet and trap inlet to mutually isolate the liquids in said bowl and trap, and a second position, wherein liquid may flow by gravity from said bowl outlet to said trap inlet;

d. a passageway connecting said bowl outlet and trap inlet, said dam means being disposed in said passageway and

said trap being laterally disposed with respect to said bowl outlet to permit direct visibility of the liquid at said trap inlet through said bowl outlet and passageway when said dam means is in said first position;

e. first means for effecting movement of said dam means between said first and second positions;

f. second means for providing a flow of flushing liquid into said bowl; and

g. actuating means manually movable to effect cooperative actuation of both said first and second means.

3,922,730

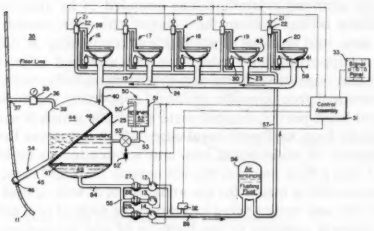
RECIRCULATING TOILET SYSTEM FOR USE IN AIRCRAFT OR THE LIKE

James M. Kemper, Sherman Oaks, Calif., assignor to Monogram Industries, Inc., Santa Monica, Calif.

Filed Mar. 11, 1974, Ser. No. 449,619

Int. Cl.² E03D *5/016*

U.S. Cl. 4—10 **11 Claims**



1. A recirculating toilet system for use in a pressurized cabin of an aircraft or the like comprising:

at least one toilet assembly disposed in said cabin having a valve-controlled drain line;

a waste tank under vacuum operatively connected to said drain line having a pressure in its interior at a lesser pressure than the exterior pressure at the toilet assembly; vacuum controlling means associated with said tank for controlling the vacuum within the interior of the tank;

a valve-controlled flushing line communicating with both the interior of said tank and said toilet assembly; and

at least one pump disposed in said flushing line having an inlet in fluid communication with the interior of said tank and an outlet in fluid communication with said toilet assembly; and

at least one pump disposed in said flushing line having an inlet in fluid communication with the interior of said tank and an outlet in fluid communication with said toilet assembly.

3,922,731

FLUSH VALVE HANDLE ARRANGEMENT

Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 22, 1974, Ser. No. 463,006

Int. Cl.² E03D *5/02*

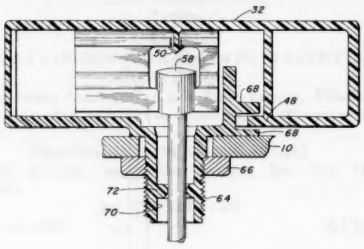
U.S. Cl. 4—67 R **12 Claims**

1. A one piece handle assembly for operating the flush mechanism of a water closet tank by means of an operating rod, comprising

a first part adapted to be fixedly positioned with respect to the tank and having an opening for said operating rod to pass;

means forming a fulcrum of said rod associated with said first part; and

a handle body directly connected to the first part by an integral hinge and having one end of said rod connected thereto, said handle body being movable about said hinge



to pivot said rod about said fulcrum, and thereby operate said flush mechanism.

3,922,732

METHOD OF AND SYSTEM FOR HEATING SWIMMING POOLS

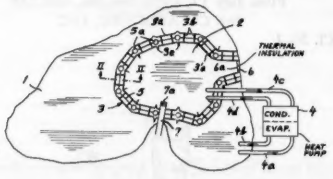
Wolfgang Friedel, Danziger Strasse 2, 6944 Hemsbach am der Bergstrasse, Germany

Filed May 13, 1974, Ser. No. 469,303

Claims priority, application Germany, May 12, 1973, 2324208

Int. Cl.² E04H *3/16*

U.S. Cl. 4—172 **10 Claims**



1. A method of providing a heated swimming pool in a colder environment, comprising the steps of thermally insulating a limited water volume within a larger body of water against the surrounding water along a substantially closed boundary terminating short of the bottom of said body of water to delimit a downwardly open enclosure, circulating a first flow from said surrounding water through a heat pump for abstracting heat therefrom, and circulating a second flow from said limited water volume through said heat pump for elevating the temperature thereof by the heat abstracted from said first flow, with direct contact between the heated water within said boundary and an underlying mass of colder water from said larger body.

3,922,733

PORTABLE SINK OVER-FLOW DEVICE

Halsey H. Lyon, 110 Van Winkle, San Anselmo, Calif. 94960, and Frank H. Deimel, 1450 31st Avenue, San Francisco, Calif. 94122

Filed July 25, 1974, Ser. No. 491,744

Int. Cl.² E03C *1/24*

U.S. Cl. 4—191 **6 Claims**

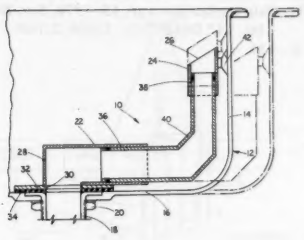
1. A portable, temporary sink over-flow device comprising: an elbow duct;

means sealing off the end of one leg of said elbow duct;

a bottom opening adjacent said one end adapted for registry with a sink drain;

a plate of relatively large area secured to said one leg so that water pressure may be asserted over the area thereof to

anchor said elbow duct against flotation without firm attachment thereof to a sink; and



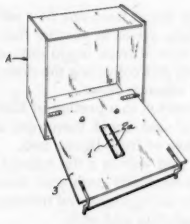
means on the bottom of said one leg adapted to seal around said bottom opening and around a sink drain.

3,922,734

NEW SLIDING SYSTEM APPLIED TO FOLDAWAY FURNITURE

Jose Pardo Herrera, Carretera de Logrono, Km. 1,7, Zaragoza, Spain

Filed Feb. 4, 1974, Ser. No. 439,587
Claims priority, application Spain, Feb. 3, 1973, 411250
Int. Cl.² A47C *13/38*
U.S. Cl. 5—2 B **3 Claims**



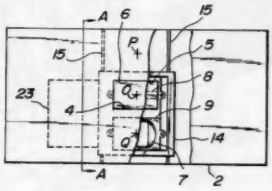
1. An article of furniture in the form of a combination cabinet and folding bed comprising a cabinet having a bottom wall, spaced apart vertical side walls, a top wall, a vertical rear wall and an open front, a front panel having a lower end portion hingedly attached to the cabinet so as to be movable from a closed vertical position wherein it closes off the open front and forms a front wall for the cabinet into an open horizontal position, a channel strip fixedly superimposed on the inside face of the front panel and disposed at right angles to the hinged horizontal axis of the front panel, an articulated mattress bed unit composed of hingedly attached sections and adapted to be folded into a collapsed condition with the sections vesting on one another and to be stored in such collapsed condition within the cabinet, a strip member slidable in said channel strip for longitudinal movement normal to the hinged axis of the open front panel, a pivot member carried by the slidable strip member and arranged perpendicular thereto, a guide strip affixed to one of the bed unit sections and rotatably mounted on the pivot member whereby the bed unit can be slid out from the cabinet and the sections opened and then the open bed unit can be rotated about the pivot member to place the open bed in selected angular positions on the open front panel relative to the cabinet.

3,922,735

BED FOR PATIENT

Hisao Kato, No. 37, 2-Chome, Showa, Nemuro, Hokkaido, Japan

Filed May 6, 1974, Ser. No. 467,535
Claims priority, application Japan, May 7, 1973, 48-49690
Int. Cl.² A61G *7/04*
U.S. Cl. 5—91 **5 Claims**



1. A bed for a patient, comprising a base frame, and a thick first mat on the base frame, the first mat and the base frame being formed with a hole, and the bed further comprising:

a cover plate with a second mat arranged below said first mat and vertically movable upwardly into said hole formed in said first mat and said base frame to snugly close said hole and downwardly away from said hole to open the same, the upper surfaces of said two mats being substantially flush with each other to provide a comfortable support for the patient when said second mat is in said hole of said first mat; a flush pot for the patient's excretion arranged below said first mat and vertically movable upwardly into said hole of said mat and said base frame in place of said second mat to such a level that the rim of said pot is flush with the upper surface of the first mat and downwardly away from said hole;

a support frame for supporting said cover plate with said second mat and said flush pot side by side; lifting guides arranged in said support frame for vertically guiding said cover plate with said second mat and said flush pot, respectively;

lifting mechanisms for separately lifting said cover plate and said pot along said guides, respectively;

rails fixed with respect to said base frame and on which said support frame is movably mounted; and

a driving mechanism for horizontally reciprocatingly moving said support frame along said rails to move said cover plate from a first position corresponding to the center of said hole to a second position spaced from said first position and simultaneously to move said pot from a first position to a second position corresponding to the center of said hole and vice versa.

3,922,736

MACHINE AND METHOD FOR SPACE DYEING

Emery M. Mand, Los Angeles, Calif.; Joyce C. Amley, deceased, late of La Mirada, Calif., and by Loretta Amley, executrix, La Mirada, Calif., assignors to Mand Carpet Mills, Los Angeles, Calif.

Continuation of Ser. No. 200,738, Nov. 22, 1971, abandoned.
This application Nov. 2, 1973, Ser. No. 412,294
Int. Cl.² D06P *1/00*
U.S. Cl. 8—149 **37 Claims**

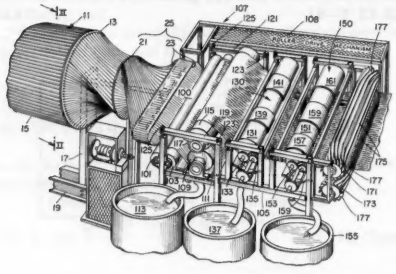
1. A machine for dyeing each of a plurality of strands of yarn with a random coloration along the length thereof comprising

means for arranging said plurality of strands in substantially a single plane defining a center line axis,

means for moving said plurality of strands longitudinally through the single plane,

means for constantly varying the position of each strand of said plurality of strands relative to the axis of the plurality

thereof and the point of entry of each strand of said plurality into the machine, and



means for applying a dye only to the strands of said plurality which traverse a predetermined location relative to the lateral and longitudinal limits of the plane.

3,922,737

PROCESS FOR THE CONTINUOUS WET-TREATMENT UNDER PRESSURE

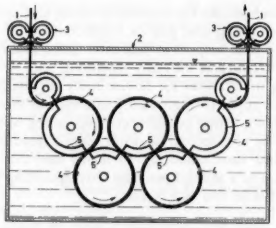
Hans-Ulrich von der Eltz, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 26, 1973, Ser. No. 344,987

Claims priority, application Germany, Mar. 29, 1972, 2215280

Int. Cl.[2] D06B *3/02*

U.S. Cl. 8—151 **3 Claims**



1. In a process for the continuous fixation of heat-fixable dyestuff on a textile material using a hot liquid as the fixation medium, the improvement which comprises: fixing said dyestuff upon said textile material under superatmospheric pressure conditions and at a temperature of from 105°C to 145°C, by passing the said textile material impregnated or printed with said dyestuff through a dyestuff-free fixation liquid at a temperature of 105°C to 145°C, said fixation liquid being contained within a pressure-sealed fixation zone, the pressure throughout said zone being maintained above atmospheric pressure, and over the surface of a rotating perforated drum within said pressure-sealed fixation zone, while maintaining a pressure differential between the liquid and the interior of the said drum, such that liquid is caused to pass through the material and into the drum.

3,922,738

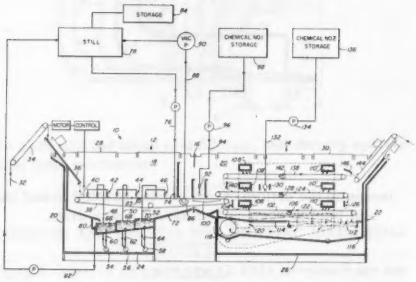
METHOD FOR TREATING A RUNNING FABRIC WEB

William J. Holm, Springfield, Vt., assignor to Riggs & Lombard, Inc., Lowell, Mass.

Division of Ser. No. 207,430, Dec. 13, 1971, Pat. No. 3,803,879. This application Apr. 15, 1974, Ser. No. 460,926

Int. Cl.[2] D06B *1/02, 15/04, 21/00*

U.S. Cl. 8—151 **1 Claim**



1. The method of treating a running fabric web, comprising the steps of,

a. transporting said web in a flat relaxed condition longitudinally along a horizontal path,

b. directing separate flows of a treatment liquid transversely across the upper surface of said web at different longitudinally spaced positions along said path while agitating said web,

c. collecting the drains from one flow and recycling at least a portion of the drains in another flow,

d. directing a flow of fresh liquid onto said web after said separate flows and collecting the drains thereof for recycling in said separate flows,

e. applying a vacuum to a portion of said web to remove at least some of said liquid therefrom after said web has received a flow of fresh liquid, and,

f. transporting said web in a flat relaxed condition along a second predetermined path and directing a flow of a heated gas including vaporized treatment liquid over said web while agitating said web.

3,922,739

APPARATUS FOR CONVERTING SEA WAVE ENERGY INTO ELECTRICAL ENERGY

Ivan Andreevich Babintsev, Bulvar Yana Rainisa, 20, korpus 2, kv. 152, Moscow, U.S.S.R.

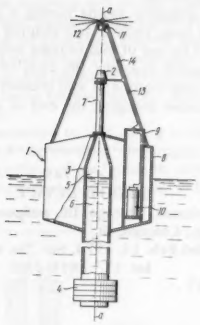
Filed Apr. 18, 1974, Ser. No. 462,090

Int. Cl.[2] B63B *21/52*

U.S. Cl. 9—8 R **1 Claim**

1. An apparatus for converting sea wave energy into electrical energy, comprising: a buoy which executes periodic forced vibrations with a natural frequency approximating the wave frequency along the vertical axis thereof in a manner that the buoy moves with respect to the wave surface; an air chamber in said buoy; a hydraulic piston in said buoy; a turbogenerator for converting the airflow kinetic energy into electrical energy; a turbine stage including rigidly fixed blades in said turbogenerator; a stator including rigidly fixed blades of said turbine stage; a rotor of said turbine stage, disposed downstream of said stator with respect to the direction of said airflow; a supplementary stator including rigidly fixed blades of said turbine stage, disposed downstream of said rotor with respect to the direction of said airflow and made symmetrical with said stator with respect to the plane of rotation of said

rotor; a generator of said turbogenerator; a shaft of said generator; also mounted whereon is said rotor of said turbine stage;



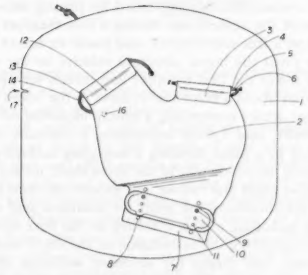
an air duct for said air chamber to communicate with said turbogenerator.

3,922,740

HAND SWIM FINS

Glenn J. Potter, 1332 South Hope Street, Los Angeles, Calif. 90015

Filed Feb. 26, 1975, Ser. No. 553,219
Int. Cl.[2] A63B *31/02*
U.S. Cl. 9—307 8 Claims



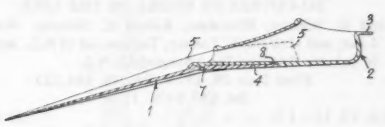
1. Paired swim fins fitting left and right hands of the user comprising in the case of each hand the combination of an essentially rigid thin planar plate of appropriate size and generally rounded shape, and a hand cover, releasable at one or more of its attachments to said plate, of such construction as to hold the hand, palmar surface against the plate, said combination obtaining for the power stroke a dynamic balance centered at about the center of the palm and presenting with the hand when moved through the water on the back stroke, ulnar edge leading, low resistance because of the thinness and flatness of the plate, the streamlining of the hand cover, and the alignment of the digits behind one another; said combination being non-buoyant and of low mass; said combination fastening only to the body of the hand and not to the digits or wrist so as not to hamper movement of anatomical parts especially pronation of the hand, nor style particularly swimming on the back; said combination further being of graded sizes to fit various hand sizes and muscular powers, or otherwise said combination being of graded sizes to fit various hand sizes and muscular powers and also with structure offering adjustment means for fitting a variety of shapes and sizes of hands.

3,922,741

COMPOSITE SWIM FINS

Roberto Semeia, Rapallo, Italy, assignor to AMF Mares Sub S.p.A., Rapallo, Italy

Filed Jan. 9, 1974, Ser. No. 431,693
Claims priority, application Italy, Jan. 9, 1973, 12405/73
Int. Cl.[2] A63B *31/10*
U.S. Cl. 9—309 2 Claims



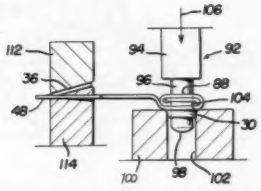
1. A swim fin comprising a scoop member made from a relatively stiff plastic material molded to a shoe member made from a relatively soft synthetic elastomer, said scoop member having two side webs laterally surrounding at least the fore end of the shoe member, the upper edge of each side web having an inwardly extending rim, said side webs having at least one side opening and at least one vertical bore passing through the side webs' upper rim through which the molded shoe material on the outer surface of the shoe side wall penetrates, said scoop member having a planar portion coextensive with and extending substantially longitudinally of the front sole portion of the shoe member and extending laterally between the side webs to thereby form a half-sole portion for the shoe member, said planar portion of the scoop member having recesses and projections in its upper surface engaging the lower surface of the shoe sole, whereby the molded shoe material on the lower surface of the shoe sole penetrates the recesses on the sole portion of the scoop member, and the projections thereon are embedded into said lower surface of the shoe sole, thereby providing an additional mechanical bond between the scoop member and the shoe member.

3,922,742

METHOD OF MAKING A LAMINATED NUT AND CLIP

Robert Harvey Markey, Warren, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Filed Aug. 15, 1974, Ser. No. 497,814
Int. Cl.[2] B21D *53/24*
U.S. Cl. 10—86 R 11 Claims



1. A method of forming a nut, comprising the steps of:

a. piercing a circular hole through a plurality of generally flat laminae retained in face-to-face contact, with a piercing tool disposed from one side face of said laminae forming generally ragged edges on the opposite face of said laminae,

b. extruding an integral barrel portion in said laminae by disposing a cylindrical punch through said pierced hole from opposite said one laminae side face, thereby extruding the ragged pierced laminae edges into said barrel portion, said punch having a diameter greater than the diameter of said pierced circular hole and forming a barrel end extending from said one side face of the lami-

nae with each lamina having a conical portion nested within said barrel portion; and

c. forming a continuous female spiral thread in said pierced laminae hole on the edges of said laminae surrounding said hole through said opposite side face of said laminae.

3,922,743

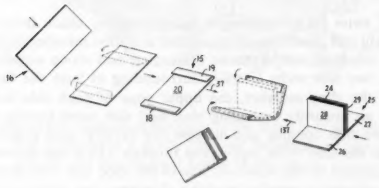
METHOD AND APPARATUS FOR APPLYING JACKETS TO COVERS OF BOOKS OR THE LIKE

Emil H. Schuler, Riverdale; Robert C. Schuler, Woodcliff Lake, and Howard N. Lathey, Tappan, all of N.J., assignors to Schuler Brothers Inc., Bergenfeld, N.J.

Filed June 28, 1974, Ser. No. 484,323

Int. Cl.[2] B42C *15/00*

U.S. Cl. 11—1 R **36 Claims**



1. A method of applying jackets to the covers of books, comprising the steps of converting successive sheet-like blanks into jackets each of which includes a central panel and two flaps flanking the panel; moving successive jackets to an assembly station along a first path; opening successive books so that their covers are spaced apart from the leaves; moving the thus opened books to said assembly station along a second path so that portions of the covers of a book enter between the panel and the flaps of a jacket at said station; and closing the book so that the flaps of the respective jacket are located between the covers and leaves of the thus jacketed book.

3,922,744

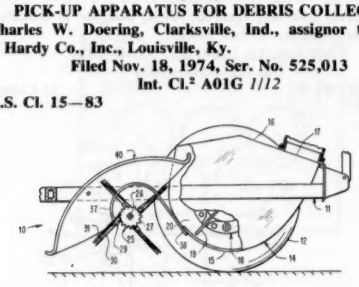
PICK-UP APPARATUS FOR DEBRIS COLLECTOR

Charles W. Doering, Clarksville, Ind., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Filed Nov. 18, 1974, Ser. No. 525,013

Int. Cl.[2] A01G *1/12*

U.S. Cl. 15—83 **10 Claims**



1. An apparatus for collecting debris including:

a frame having wheels to support said frame;

a housing supported by said frame;

said housing having compression means to compress debris received by said housing;

and debris pick-up means rotatably supported by said frame to pick up debris for supply to said housing for compression;

said debris pick-up means including:

support means for rotation about a substantially horizontal axis;

means to rotate said support means;

said support means having a plurality of brushes supported thereon and angularly spaced from each other about the axis of rotation;

each of said brushes being formed in a helix;

stripping means supported by said frame for cooperation with each of said brushes separately to strip debris therefrom just prior to the debris entering said compression means;

and said stripping means having a plurality of spaced stripper bars, each of said stripper bars having its end engaged by one of said brushes separately, and each of said brushes engaging the ends of all of said stripper bars during rotation of said brushes prior to the next of said brushes engaging the end of any of said stripper bars.

3,922,745

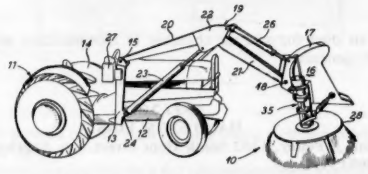
BROOM DEVICE

Gerhard H. Lehman, Chicago, Ill., assignor to Elgin Sweeping Services, Inc., Chicago, Ill.

Filed Feb. 14, 1974, Ser. No. 442,499

Int. Cl.[2] E01H *1/05*

U.S. Cl. 15—87 **8 Claims**



1. A broom device for use on a vehicle for sweeping surfaces which are located at different elevations relative to the surface on which the vehicle is supported, the vehicle having a frame, a boom structure mounted for pivotal movement on the frame of the vehicle and having a first member pivotably mounted on a free end thereof, said boom structure including means to pivot the boom structure relative to the vehicle to raise and lower the first member and means for pivoting the first member about a pivot axis relative to the boom structure, said broom device comprising a broom mounted on an end of a drive shaft, said broom comprising a plurality of bristles terminating in a plane forming a sweeping surface extending substantially perpendicular to the drive shaft, means for rotating the drive shaft and broom and means attached to the first member for mounting the shaft for rotation, said means for mounting including a base attached to the first member and means for adjusting the orientation of the drive shaft relative to said base, said means for adjusting including an element supporting the means for rotating the drive shaft and having bearings for rotatably supporting said drive shaft, a second member supported on said base, a first arm extending from the second member and pivotably connected to the element, and an adjustable arm pivotably connected to the second member and attached to said element so that the raising and lowering of said first member by said boom structure enables sweeping surfaces located at different elevations relative to the surface on which the vehicle is supported and pivoting of said first member relative to said boom structure enables changing the angle of the sweeping surface of the broom relative to the surface being swept.

3,922,746

BLEEDER VALVE CLEANER

Fred E. Strunk, 205 Landana St., Vallejo, Calif. 94590

Filed May 8, 1974, Ser. No. 467,954

Int. Cl.[2] B08B *9/02*

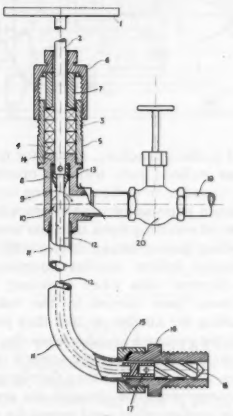
U.S. Cl. 15—104.1 R **3 Claims**

1. In a cleaner suitable for cleaning a bleeder valve in a high pressure line without reducing the pressure in the line, said cleaner including a casing, coupling means mounted to one

end of said casing and adapted for fluid-tight coupling of said cleaner to said valve, shaft means rotatably and reciprocally mounted in said casing and extending from proximate the coupling end of said casing to a position outwardly of the opposite end of said casing, a drill connected to said shaft means proximate the coupling end of said casing, said shaft means outwardly of said casing being adapted for engagement to effect rotation and reciprocation thereof, and a valve connected to said casing and adapted for selective venting of the interior of said casing, the improvement comprising:

said shaft means being formed with an inflexible, smooth surfaced section;

a packing gland mounted to said casing in fluid-tight relation thereto and surrounding and engaging said shaft means over a portion of said smooth surfaced section, said gland being adapted to provide a high pressure,



fluid-tight seal between said smooth surfaced section and said gland while permitting reciprocation and rotation of said shaft with respect thereto;

said smooth surfaced section having an overall length at least about equal to the length of said gland plus the length that said shaft means is to be reciprocated;

said shaft means and said casing being provided with oppositely facing shoulders formed for interengagement to limit the displacement of said shaft means in said casing away from the coupling end thereof to prevent said smooth surfaced section from reciprocation to a position out of sealed engagement with said gland; and

said shoulders being formed and said shaft means having a length causing said drill to be positioned substantially inside said casing upon interengagement of said shoulders.

3,922,747

MAGNETIC WINDOW CLEANING APPARATUS WITH IMPROVED CLEANING MATERIAL

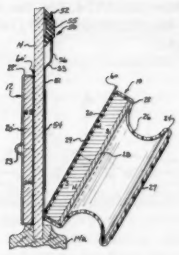
John A. Kaftan, 324 N. Roosevelt, Green Bay, Wis. 54301

Division of Ser. No. 90,900, Nov. 19, 1970, Pat. No. 3,751,750, which is a continuation-in-part of Ser. No. 807,524, March 17, 1969, Pat. No. 3,609,793. This application July 23, 1973, Ser. No. 381,539

Int. Cl.[2] A47L *1/08*

U.S. Cl. 15—220 A **6 Claims**

1. A magnetic window cleaning apparatus of the type having a pair of units adapted to be positioned on either side of a window opposite each other, each unit having a window-facing side and magnet means for attracting the opposite unit, one unit being a master unit adapted to be moved over one side of the window, and the other unit being a slave unit adapted to follow the master unit, wherein the improvement comprises: the window-facing side of each unit being substantially flat over its entire area; a sheet of cleaning material overlying the window-facing side of each unit and comprising a layer of absorbent paper of preselected thickness having polyethylene chips of 35 mesh size on only the window-facing side of the paper; the polyethylene being about 0.005 inch thick and in a discontinuous layer so that about 50% of the



area of the paper is exposed for its absorption function; the polyethylene providing a reduced friction between the cleaning material and the window; and the window-facing side of each unit being formed at least partly of rubber to provide a high-friction surface for engaging the paper at the back side of the cleaning material so that the cleaning material will adhere to the rubber surface without additional fastening means as the unit is moved over the window.

3,922,748

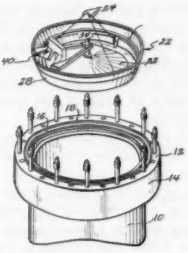
REACTOR VESSEL SEAL SERVICE FIXTURE

William C. Ritz, Greensburg, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 9, 1974, Ser. No. 468,322

Int. Cl.[2] F22B *37/48*

U.S. Cl. 15—246.5 **6 Claims**



1. Apparatus for the removal of a surface coating on a circularly arranged surface located in the upper edge of an open cylindrical vessel comprising:

a. stationary pan means having a frustoconical side wall adapted to be supported on a vessel;

b. truck means for riding on the top edge of said side wall;

c. means pivoted on the center axis of said pan for guiding said truck means in its circular movement along the top edge of said side wall;

d. said truck means including means to propel itself and said pivoted means; and

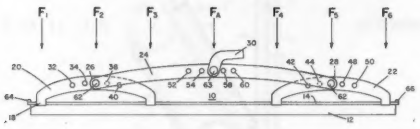
e. means including cleaning means supported by said pivoted means, said cleaning means being adapted for riding on the upper edge surface of a cylindrical vessel for clean-

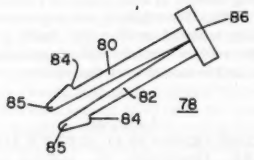
ing a cylindrical surface as said truck means rotates along said side wall top surface about said axis.

3,922,749
ADJUSTABLE WINDSHIELD WIPER BLADE

Curtis H. Castleman, Jr., Evergreen, and Irwin C. Cone, Littleton, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 20, 1974, Ser. No. 452,855
Int. Cl.² B60S *1/04*, *1/40*
U.S. Cl. 15—250.42 **11 Claims**





1. In a windshield wiper blade having a wiping element and a flexible backing member associated therewith, a pressure distributing superstructure attached to the backing member comprising a primary yoke and a pair of secondary yokes attached intermediate their ends to the primary yoke, said primary yoke having intermediate its ends means pivotally engageable with a pressure transmitting wiper arm at a pivot point, and said secondary yokes having a plurality of means attaching the flexible backing member at discrete spaced longitudinal points therealong thereby transmitting forces to the backing member at each of the spaced points, the improvement comprising:

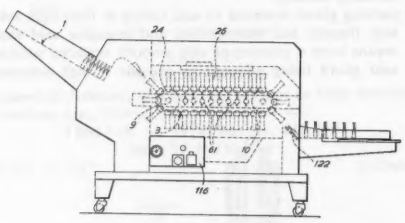
both of said attachments between the primary yoke and secondary yokes, and the pivotal attachment between the means of the primary yoke and of the wiper arm, respectively, being adjustable between a plurality of longitudinal points to form a plurality of selectable discrete attachment positions so that at least in one of the attachment positions the forces transmitted to the backing member on either side of a transverse plane passing through the pivot point are unbalanced with respect to one another.

7. In combination, a wiper arm connector having a through bore and a windshield wiper having a through bore coupled together with the wiper arm connector by a connecting pin joining in side-by-side alignment the respective bores, said connecting pin comprising a head portion at one end of the bores and located outside the bores, a bilobed resilient body contained within the bores and normally split apart, the bilobed body terminating at the outside of the bores opposite the head portion in a pair of shoulder stop portions for retention of the pin in assembled connecting relationship, whereby the arm connector and windshield wiper may be disconnected by depressing together the shoulder portions of the pin and sliding the pin out through the aligned bores.

3,922,750
MACHINE FOR CONTINUOUSLY WASHING OPEN VIALS

Elisabetta Cioni; Lucia Cioni, and Rovena Anichini, widow Cioni, all of 22, Via di Marciano, Siena, Italy (I-53100)

Filed Mar. 8, 1974, Ser. No. 449,443
Claims priority, application Italy, Mar. 12, 1973, 9374/73
Int. Cl.² B67C *1/06*
U.S. Cl. 15—302 **7 Claims**



2. In a vial washing machine, means for feeding individual vials down an inclined path with the openings of the vials directed downwardly, an endless indexing conveyor including means defining a plurality of rows of spaced seats, each seat being capable of receiving from the feed means one said vial with the opening thereof facing downwardly, an assembly of upwardly-directed hollow needles complementary to the downwardly-directed vials when stationary at a station to which they have been carried by the indexing conveyor, means for raising the needles so that they penetrate into the vials to effect the required washing when the vials are stationary, and means for discharging the washed vials along an arc which inclines the vials so that they slide from said seats, said feed device comprising slide channels for arranging the vials in side-by-side configuration, and means for raising said vials in said channels, said channels defining an arcuate track which extends upwardly and then downwardly toward said seats in the path of said vials, to cause said vials to be tilted as they are raised over the arcuate track to introduce the vials into the seats at a reception station.

3,922,751
AIR ETCHING OF POLYMERIC PRINTING PLATES

Forrest A. Wessells, Baltimore, and John E. Pickard, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 351,415, April 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 316,253, Dec. 18, 1972, abandoned, which is a continuation-n-part of Ser. No. 178,723, Sept. 8, 1971, abandoned. This application Aug. 14, 1973, Ser. No. 388,234
Int. Cl.² A47L *5/38*
U.S. Cl. 15—306 R **22 Claims**

1. Apparatus comprising in combination,

a. a frame;

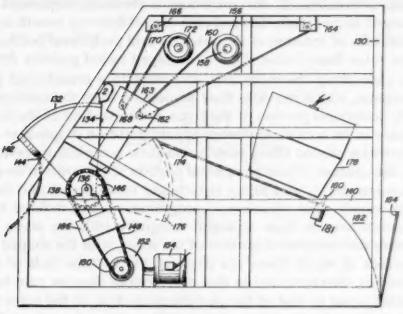
b. an air knife affixed in said frame and comprising a chamber with air inlet means and air exit means; said air exit means consisting of a spaced gap in the said chamber adapted to shape air exiting therefrom as a sheet; and

c. a wedge shape frame, arcuate at its wide area and pivoting at its apex, and carrying a convex platen, said platen being adapted to move under said air knife.

2. Apparatus according to claim **1** including means to pivot the platen under the air knife and to return the platen to its starting position.

7. The apparatus of claim **2** in which the air knife assembly contains a blotting assembly adapted to blot the letter-press plate after it has passed under the air knife, comprising at least one blotting system comprising elements:

1. a supply roll of blotting web;
2. a pressure roll adapted to press said blotting web against the letter-press plate; and



3. a take-up roll adapted to roll up used blotting web.

8. The apparatus of claim 2 in which the air knife assembly comprises two blotting systems comprising said elements (1), (2), and (3).

3,922,752

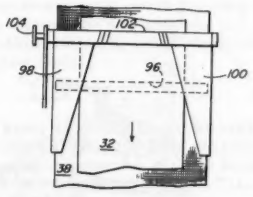
FABRIC TREATMENT APPARATUS

William J. Holm, Springfield, Vt., assignor to Riggs & Lombard, Inc., Lowell, Mass.

Division of Ser. No. 240,602, April 3, 1972, Pat. No. 3,828,587. This application Aug. 12, 1974, Ser. No. 496,876

Int. Cl.[2] A47L *5/38*

U.S. Cl. 15—307 **3 Claims**



1. Apparatus for selectively closing the ends of suction slot extending transversely with respect to a longitudinally moving web passing thereover, comprising,

a. a reefing roller mounted above said web in advance of said slot and parallel thereto,

b. a pair of tapered flexible and substantially imperforate curtains attached at their wider ends to the opposite ends of said roller and having their free ends trailing over opposite ends of said slot,

c. said curtains having their outer edges parallel to said web and their inner edges converging towards said roller, and,

d. means for rotating said roller to selectively lengthen or shorten said curtains whereby the ends of said slots may be effectively opened and closed according to the width of said web.

3,922,753

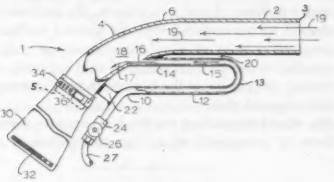
COMPRESSED AIR CLEANING TOOL

William F. Aberilla, 45-111 E. Waikapoki Road, Kaneohe, Hawaii 96744

Filed May 29, 1973, Ser. No. 364,872

Int. Cl.[2] A47L *5/18*

U.S. Cl. 15—409 **10 Claims**



1. A vacuum cleaning tool apparatus for attachment to a compressed air supply comprising a curved tube having an open distal end, a relatively straight and relatively long axially extending portion leading inward from the distal end, a curved portion extending downward from the straight portion remote from the distal end, the curved portion terminating in a proximal end, an air supply line connected to the tube at an inside of the curved portion near an intersection with the straight portion for directing compressed air from a supply into the tube toward the outside of the curved portion in a direction away from the distal end and toward the proximal end for forcing the compressed air from the supply through the proximal end of the tube, entraining fluid within the tube and carrying entrained fluid out through the proximal end, thereby creating a reduced pressure near an intersection of the curved and straight tube portions for causing fluid to flow into the straight tube through the open distal end, thereby entraining materials and flowing materials into the curved portion and out of the proximal end.

5. The apparatus of claim **2** wherein the air supply tube comprises a rigid tube extending generally parallel to the straight portion and opening into the distal end curved portion beneath the straight portion for directing air into the curved portion, parallel to the straight portion and impinging air on the opposite wall of the curved portion, thereby forming a cone which draws air through the straight portion down into the curved portion and out through the proximal end.

6. The apparatus of claim **5** wherein the rigid tube further has a curved portion, curving downward beneath the straight portion and a lower portion spaced further downward from the straight portion, and wherein the tube is anchored to the straight portion and to the curved portion of the main tube, thereby forming a loop for inserting fingers when holding the tool.

7. The apparatus of claim **6** further comprising a downward extending portion of the supply tube extending generally parallel to the main curved tube and control valve means connected to the downward extending portion for controlling supply air to the air supply tube.

3,922,754

TWO-WHEEL CASTOR FOR A CHAIR OR THE LIKE

Jens Peter Andersen, Jernbanealle 35, 3060, Espergaerde, Denmark

Filed Feb. 4, 1974, Ser. No. 439,187

Claims priority, application Denmark, Feb. 13, 1973, 777/73

Int. Cl.[2] B60B *33/00*

U.S. Cl. 16—18 **5 Claims**

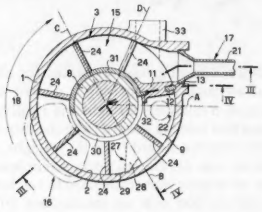
1. An improved two-wheel castor for a chair or the like having shaft means extending downwardly therefrom, comprising casing means having a hole therein through which said shaft means can be downwardly inserted, and wheel supporting means within said casing means, said wheel supporting

means having a hole therein for receiving said downwardly inserted shaft means and having a central bore, pin means inserted into said bore and two opposed wheels mounted on said pin means, at opposite sides of the wheel supporting means,

wherein the improvement comprises the combination of the following further features:

i. the casing means is a hollow casing adapted to enclose the major portion of said two wheels, the interior of which is shaped to correspond with the curved surface of a segment of a solid of revolution about an axis extending parallel to the chordal plane of said segment, said casing having an opening at the bottom thereof corresponding to said chordal plane;

ii. the wheel supporting means is a separate member in the form of a segment of a disc, the radius of the curved



portion of the periphery of the disc corresponding to the maximum radius of said solid of revolution and the perpendicular height from the center of the chord of the disc segment to said curved portion of the periphery of the disc being greater than the radius of said curved portion but smaller than the maximum dimension of said opening at the bottom of the casing;

whereby to assemble the castor said separate wheel supporting member having the two wheels mounted thereon are inserted through the opening at the bottom of the casing and then turned until the holes in the casing and the wheel supporting means are in registration to permit downward insertion of said shaft means extending from the chair or the like, the castor being disassembled by retracting said shaft means and turning the wheel supporting member until it is removable through said opening.

3,922,755

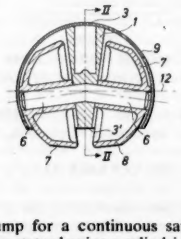
ROTARY PUMP FOR FEEDING A CONTINUOUS SAUSAGE-MAKING MACHINE

Giovanni Battista Righele, Via Levà, Piovene Rocchette (Vicenza), and Giuseppe Scorzato, Via Prole 22, Marano Vincentino (Vicenza), both of Italy

Filed Dec. 3, 1974, Ser. No. 529,246

Int. Cl.² A22C *11/00*

U.S. Cl. 17—33 **6 Claims**



1. A rotary pump for a continuous sausage-stuffing machine, comprising a stator having a cylindrical cavity, in whose interior there is coaxially arranged a rotor rotatable about its own axis, said rotor being composed by a central cylindrical portion lifted up to a closing lid for the stator cavity and by a peripheral lowered portion so that between said lid and said rotor there is defined a top annular chamber equipped with a filling mouth formed by a hole drilled through the lid, a delivery mouth with an axis which is substantially tangent to the median circumference of said annular chamber in the direction of rotation of the rotor and a partition diaphragm arranged immediately downstream of said delivery mouth in the direction of rotation of the rotor, in said peripheral portion of the rotor there being slidably arranged radial paddles driven to slide along the rotor axis according to a preselected programme, which provides their projection from the contour of the peripheral portion of the rotor and to said lid of the stator space in an area downstream of said partition diaphragm and upstream of said filling mouth and their complete re-entering in the contour of said peripheral portion of the rotor in an area downstream of said filling mouth and upstream of said delivery mouth, said preselected programme being defined by a bottom annular cam arranged integrally with the stator beneath said peripheral portion of the rotor, with the shaped top surface of which there are engaged the bottom ends of said paddles, characterized in that said bottom annular cam has a width equal to that of the peripheral portion of the rotor and is positioned at such a level that said peripheral portion of the rotor is tangent to said cam at the point of maximum cam elevation, so that between said cam, said rotor and said stator a bottom annular chamber is defined having a variable height and into which project the lower ends of the rotor paddles, said bottom annular chamber being in communication with said top annular chamber by means of a tiny duct which is extended partly transversally of the bottom annular cam along the top surface of said cam and partly along the internal cylindrical wall of the stator.

3,922,756

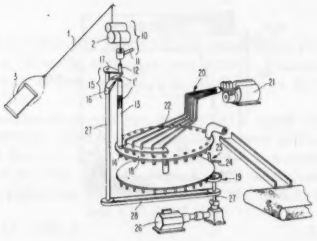
APPARATUS FOR MAKING FILLER MATERIALS

Masafumi Ogasawara; Keio Hirai, both of Otsu; Nobu Yamaguthi, Shiga; Akio Tsunekawa, Otsu; Tosiyuki Mizoguchi, Takatsuki, and Shiro Nishiumi, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,699

Int. Cl.² D01G *25/00*

U.S. Cl. 19—148 **14 Claims**



1. An apparatus for making a filler material comprising

a. a yarn feeding and cutting device,

b. a tubular guide,

c. yarn transfer means arranged for taking up the cut yarn filaments and forwarding them along said tubular guide,

d. a plurality of movable containers each of which has a curved inner surface and is adapted to be moved in a manner to be disposed in a position facing the outlet of said tubular guide, means for moving said containers in succession to and from said position,

e. gas jet means for forming the cut yarn filaments into a shperical shape of each of said containers, and

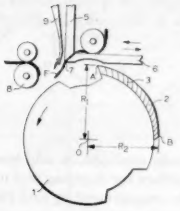
f. means for taking the spherically shaped products out of said containers.

3,922,757

COMBING CYLINDER FOR COMBING MACHINE

Tatsuo Horiuchi, Wakayama, and Akira Moriwaki, Ikeda, both of Japan, assignors to Nitto Shoji Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1974, Ser. No. 445,336
Claims priority, application Japan, Feb. 28, 1973, 48-24569
Int. Cl.² D01G 19/04
U.S. Cl. 19—234 1 Claim



1. A combing cylinder for a combing machine and comprising:

a base cylinder having central rotational axis;

a combing segment having a combing starting point and a combing ending point and including a combing segment base sector and a plurality of saw teeth wire pieces of the same radial length mounted on said base sector in side by side relation in a circumferential direction of said combing segment;

means for mounting said base sector on the outer surface of said base cylinder;

each of said saw teeth wire pieces having a series of saw teeth of the same height;

said combing segment base sector having an inner surface formed by an arcuate surface the center of curvature of which is located on said central rotational axis of said base cylinder;

said combing segment base sector having an outer surface formed by an arcuate surface the center of curvature of which is located substantially on an extension of a radial line which interconnects said rotational axis and said combing ending point of said combing segment; and

the distance between said combing starting point of said combing segment and said rotational axis being greater than the distance between said combing ending point and said rotational axis.

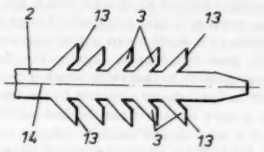
3,922,758

CLAMPING RING HAVING A CLOSURE MEMBER MADE OF SYNTHETIC PLASTICS MATERIAL

Hans Wünnenberg, Argenstrasse 27, 7993 Kressbronn, Bds., and Alfred Schobel, Bruhlstr. 324, 7212 Deisslingen-Lauffen, both of Germany

Filed Aug. 6, 1974, Ser. No. 495,289
Claims priority, application Germany, Aug. 9, 1973, 2340360
Int. Cl.² B65D 63/00
U.S. Cl. 24—16 PB 12 Claims

1. A clamping ring fastener made of plastic with a one piece fastener head molded to one end of the clamping ring, said one end having a passage, the other end of the clamping ring having a tongue-shape, said passage permitting the tongue-shaped end to be pushed therein, saw teeth respectively disposed on the lateral edges of the tongue-shaped end and on the lateral walls of the passage for interengaging with each other; characterized in that the fastener head (4) has lateral walls (5) that are interconnected on the upper side and at the level of the base of the clamping ring (1) by spacing bars (6,7) that do not overlap, so that the saw teeth (8,9) are disposed on two lateral walls always opposite each other on the places of departure of the spacing bars, and wherein stop latches (3) are disposed on the tongue-shaped end (2) so that they are



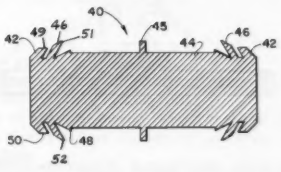
positioned at an acute angle in relation to the longitudinal axis of the clamping ring and so that they are disposed approximately at a right angle to said longitudinal axis.

3,922,759

BELT CONNECTOR WITH FLEXIBLE BITE FEATURE

Norman H. Mabie, Claremont, N.H., assignor to L. M. & L Corporation, Claremont, N.H.

Filed Feb. 18, 1975, Ser. No. 550,530
Int. Cl.² F16G 3/07
U.S. Cl. 24—31 B 11 Claims



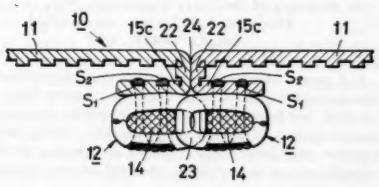
1. In a coupling insert for joining the opposite ends of an endless belt of polymeric material to form a closed loop, said insert comprising an elongate body adapted for insertion into opposite ends, the improvement wherein said coupling comprises proximate each end thereof, a flexible outwardly projecting annular gripping ring having a sharp edge thereon adapted to engage said polymer, said ring being so fastened to said body that it is adapted to flex in a direction away from said end to which it is adjacent, and wherein said coupling includes means to restrict flexing of said gripping ring toward said end of said body.

3,922,760

CONCEALED ZIP FASTENER

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 5, 1972, Ser. No. 312,292
Claims priority, application Japan, Dec. 21, 1971, 46-103885
Int. Cl.² A44B 19/12
U.S. Cl. 24—205.1 C 4 Claims



1. A concealed zip fastener comprising a pair of opposed stringer tapes each carrying a corresponding row of fastener

elements with coupling heads, each tape having on one side longitudinally extending alternate ridges and grooves, said row of fastener elements being secured to the tape along a longitudinal edge portion thereof by threads which run through and fill up certain grooves in said longitudinal edge portion, each tape being folded on itself about a fold axis defined by the groove which does not receive therein the threads and is positioned contiguously to that ridge which is one of the ridges fixedly placed on the fastener elements by the threads filing up the adjacent groove remote from the last-mentioned groove and is located in most closely intimate relation to the coupling heads of the fastener elements, the folded edge areas of said tapes being disposed in abutting contact when said rows of fastener elements are in coupled engagement.

3,922,761

SEPARABLE SLIDE-FASTENER STRINGER

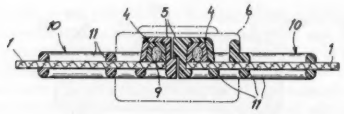
Otto Schwendt, Wuppertal-Barmen, Germany, assignor to Opti-Holding AG, Glarus, Switzerland

Filed Aug. 31, 1973, Ser. No. 393,580

Claims priority, application Germany, Sept. 1, 1972, 2242978

Int. Cl. A44b *19/36*

U.S. Cl. 24—205.11 F **5 Claims**



1. A separable slide-fastener stringer comprises a pair of textile tapes, synthetic-resin monofilament coupling elements disposed along respective edges of said tapes and interdigitating upon movement of a slider therealong, respective straight securing bars of thermoplastic material monolithically merging with said coupling elements along edges of said tapes at one end of said stringer and anchored to said tapes while running to said end of the tapes, said bars being of substantially constant thickness, and respective matingly engageable and disengageable connectors in addition to said bars molded onto each of said tapes ahead of said ends and on opposite sides thereof substantially all around portions of the respective securing bars while leaving the respective securing bar free over a portion of the length thereof beyond the respective connector and up to the ends of the tapes, said bars being melted into and monolithically unitary with the respective coupling elements, said bars being adapted to sealingly engage the mold during molding of said connectors.

3,922,762

AUTOMATIC POWER ADAPTER FOR MANUAL QUICK-ELEASE CONNECTORS

James W. Turner, and Ray E. Spinks, both of El Centro, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1974, Ser. No. 512,823

Int. Cl.² A44B *19/00*

U.S. Cl. 24—230 R **9 Claims**

1. A power adapter for attachment to a conventional, manually operable, quick-release connector having interconnectible male and female fittings, and a movable means extending transverse to said fittings for releasably locking said fittings together, said female fitting having an opening to which said movable means is accessible, and said adaptor comprising:

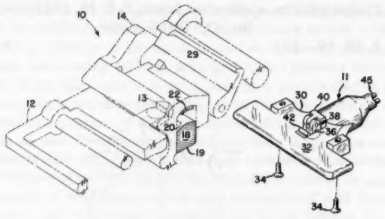
a housing;

means for mounting said housing to the female fitting adjacent said opening;

said housing having a cylinder;

a piston slidably mounted in the cylinder in a direction normal to said releasable locking means;

a self contained power source supported by said housing for actuating said piston;



an anvil pivotally mounted on said housing, said anvil having a cam surface for engaging said movable member, and a surface for engagement by said piston;

whereby activation of said power source will drive the piston to pivot said anvil, which in turn will actuate the movable member to unlock said fittings.

3,922,763

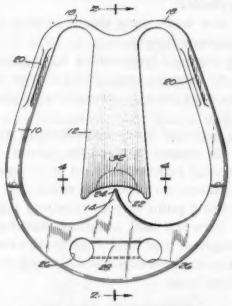
FABRIC FASTENER

Douglas Jay Buerger, 4880 S. 72nd St., Apt. 141, Greenfield, Wis. 53220

Filed Dec. 26, 1974, Ser. No. 536,503

Int. Cl.² A44B *21/00*

U.S. Cl. 24—246 **10 Claims**



1. A fastener for locking together two pieces of fabric comprising a ring having a tongue extending downwardly from the top of said ring and having a locking tab extending upwardly from the bottom of said ring under said tongue, said tongue being movable to a position at an acute angle to the plane of said ring to fit over the top edges of said fabric, and the material forming the junction of said tongue and said ring being flexible enough to permit the tongue to be displaced toward the plane of said ring past said locking tab to pinch a portion of said fabric between the bottom of said tongue and the top of said locking tab to lock the two pieces of fabric together.

3,922,764

PANEL CLIP

Lucien R. Downing, Jr., Westlake, Ohio, assignor to Donn Products, Inc., Westlake, Ohio

Continuation-in-part of Ser. No. 360,404, May 14, 1973, abandoned, which is a continuation of Ser. No. 168,675, Aug. 3, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 458,767

Int. Cl.² A44B *21/00;* **E04B** *5/52*

U.S. Cl. 24—259 **11 Claims**

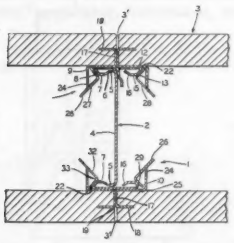
1. A wall stud for supporting the edges of panel boards in

adjacent relationship thereon by means of clip members comprising:

a. an elongated support base adapted to extend from floor to ceiling, and having opposed marginal edges;

b. said support base being adapted to support panel boards in back-to-back relation with an intermediate plenum therebetween by means of opposed panel board supporting portions carried on said marginal edges of said support base;

c. each of said panel board supporting portions comprising an outward extension attached to said support base on the marginal edge thereof, and disposed at an angle to said support base;



d. a panel board support flange carried by said outward extension on a reversely bent portion on said outward extension to extend inwardly toward said support base marginal edges;

e. said panel board support flange terminating in another reversely bent portion having an inwardly extension extending toward said support base; and,

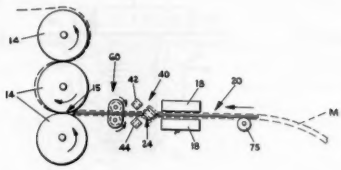
f. said panel board support portions being adapted to support the marginal edges of adjacent panel boards by means of the clip members coacting with said panel board marginal edges and the reversely bent portions of said wall stud.

3,922,765

TUBULAR FABRIC SPREADER AND FEEDING APPARATUS

Warren Hogendyk, 4017 Bell, N.E., Grand Rapids, Mich. 49505

Filed Oct. 29, 1974, Ser. No. 518,490
Int. Cl.² D06C *5/00*
U.S. Cl. 26—55 R **14 Claims**



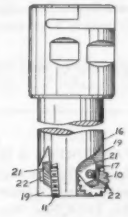
1. Calender apparatus for processing textiles comprising a plurality of elongated calender rolls; means for supporting said rolls with their longitudinal axes parallel to one another and for rotating said rolls to pull a length of tubular textile material therethrough generally transverse to said longitudinal axes of said rolls, the length of tubular material having a predetermined, unstretched, lateral width; means for laterally stretching the said continuous length of tubular material prior to insertion of the material between said calender rolls, said stretching means including a stretching frame adapted to be inserted within and entirely surrounded by the tubular material and having a width greater than said width of said unstretched material, said material exerting a force against said frame when stretched thereover which pulls said frame toward said calender rolls, and magnetic repulsion means providing a magnetic repulsion force for magnetically biasing said frame in a direction away from said calender rolls whereby said force of the tubular material against said frame is counterbalanced by said magnetic repulsion force to prevent pinching and tearing said material between said calender rolls and frame.

3,922,766

INSERTS FOR METAL CUTTERS

Paul Malinchak, 5247 W. 51st St., Fairview, Pa. 16415

Division of Ser. No. 280,777, Aug. 15, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,703
Int. Cl.² B26D *1/00, 1/12*
U.S. Cl. 29—105 R **19 Claims**



1. A rotary cutting tool comprising;

an annular body having a plurality of insert pockets spaced around the periphery of said body,

a plurality of identical inserts indexable about an axis extending transversely of the axis of said body located in said pockets,

each of said inserts having a plurality of identical evenly spaced peripheral cutting teeth,

locating means differently positioned in successive pockets in said body adapted to engage and locate any one of the teeth of respective inserts in successive phased relation to provide a progressive fractional distribution of cutting action,

and the cutting teeth of each insert being indexable in any one of said pockets to present alternate identical cutting teeth in identical cutting position of any one of said pockets.

3,922,767

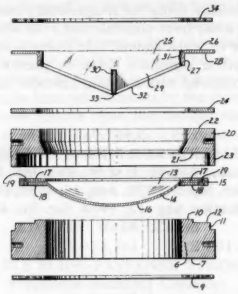
METHOD FOR PRODUCING PRE-MOUNTED RUPTURE DISCS

Robert L. Solter, Blue Springs, and Franklin A. Hansen, Raytown, both of Mo., assignors to Continental Disc Corporation, Riverside, Mo.

Continuation-in-part of Ser. No. 189,567, Oct. 15, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 398,223
Int. Cl.² B23P *15/00*
U.S. Cl. 29—157 R **4 Claims**

1. The method of producing a safety pressure relief device disc unit having a reverse buckling rupture member including an annular flange portion and a central bulged portion, said disc unit having a metallic inlet seating ring positioned on said disc flange portion and secured with respect thereto, said seating ring having an inner ring diameter many times greater than the thickness thereof and including an inner edge radius supporting said rupture member between said flange portion and said bulged portion, said method including the steps of producing said inner ring diameter and inner edge radius together with the producing of said ring from a blank through stretching and deforming the metal thereof by shear punching through a square corner die a portion therefrom to form said ring diameter and inner edge radius without material bending adjacent thereto, said inner edge radius being caused by metal flow during said punching operation without causing any

deformation at the lower inner edge, engaging the rupture member with said punched ring adjacent said inner edge



radius, and bulging a portion of said disc through said ring against said radius.

3,922,768

METHOD OF MANUFACTURING A HEAT EXCHANGER

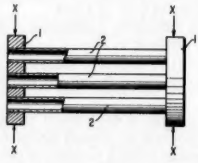
Kiyotelu Takayasu, C8-108, Nakatomigaokadanchi, 4162-1, 1-chome, Nakatomigaoka, Nara, Japan

Filed June 26, 1974, Ser. No. 483,299

Claims priority, application Japan, June 26, 1973, 48-72498; Dec. 10, 1973, 48-137990; Dec. 10, 1973, 48-137992; Dec. 10, 1973, 48-137993; Dec. 10, 1973, 48-137994; Aug. 16, 1973, 48-91854; Oct. 1, 1973, 48-110828

Int. Cl.[2] B21D *53/02;* **B23P** *15/26*

U.S. Cl. 29—157.3 R **8 Claims**



1. A method for manufacturing heat exchangers having a plurality of pipes as the heat exchanging component and opposing end plates to which the pipes are connected, comprising the steps of:

inserting each tip portion of each of said pipes into holes bored in said end plates; and

subjecting the end plates to plastic deformation by pressing inwardly and uniformly on the peripheries of the end plates so that the pipes are thereby secured therein in tightly sealed relationship without welding or brazing.

3,922,769

METHOD FOR MAKING COMPOSITE WIRE

Robert Brenan, Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 7, 1974, Ser. No. 477,405

Int. Cl.[2] B22F *3/24*

U.S. Cl. 29—420.5 **9 Claims**

1. A method for making a composite wire having an external layer consisting essentially of an established percentage by weight of copper and an internal core portion consisting of essentially of an alloyed metallic material dissimilar to copper, said method comprising:

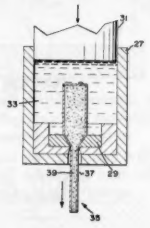
providing a substantially elongated tubular sheath member consisting essentially of copper, said sheath member having a sealed end and an open end;

filling said tubular sheath to an established level with a powdered metallic material dissimilar to copper, said filling being accomplished through said open end;

compacting said powdered metallic material within said tubular sheath;

substantially sealing said open end of said tubular sheath member to form a substantially elongated composite billet member having an established outside diameter substantially similar to the outside diameter of said tubular sheath member;

subjecting said composite billet member to a gas evacuation process to substantially evacuate said billet member of any gaseous medium located therein;



heating said composite billet member to a predetermined temperature for an established time period; and

hot hydrostatically extruding said composite billet member to reduce said established outside diameter of said composite billet member to form a composite wire having an external layer consisting essentially of an established percentage by weight copper and an internal core portion of approximately 100% densification consisting essentially of an alloyed metallic material dissimilar to copper, said alloyed metallic material in a simulated wrought condition.

3,922,770

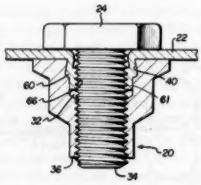
METHOD OF FORMING A PANEL ASSEMBLY

Harold A. Ladouceur, Livonia, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 353,049, April 20, 1973, which is a continuation-in-part of Ser. No. 149,517, June 3, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,277

Int. Cl.[2] B23P *9/00*

U.S. Cl. 29—445 **17 Claims**



1. In a method of forming a nut, bolt and panel assembly, said nut having a substantially flat end face, a recess opening onto said end face and a bore generally coaxially aligned and communicating with said recess, said nut bore having a smaller radius than the maximum radius of said recess, said panel being metal and having a predetermined thickness, including the steps of: abutting said end face of the nut against a face of the panel, piercing the panel in alignment with said nut bore from the face of the panel opposite said nut, extruding a portion of the panel axially into said nut recess, deforming said panel portion radially outwardly into contact with the nut recess wall to define an opening having an internal diame-

ter generally equal to the internal diameter of said nut bore, and threading a self-tapping bolt into said panel opening and nut bore thereby forming a continuous thread with said panel and said nut bore.

3,922,771

METHOD FOR THE MANUFACTURE OF DRIVING BELT PACKAGES

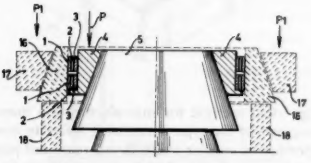
Bernard Joseph Beusink, deceased, late of Velhoven-Derle, Netherlands (by Johanna Magaretha Maria Beusink nee Overkamp, administratrix); Marinus Hubertus Cuypers, and Alexandre Horowitz, both of Eindhoven, Netherlands, assignors to Varitrac A.G., Zug, Switzerland

Filed Dec. 10, 1974, Ser. No. 531,348

Claims priority, application Netherlands, Dec. 11, 1973, 7316956

Int. Cl.² B21D *31/04, 53/14*

U.S. Cl. 29—445 **14 Claims**



1. Method for manufacturing a package of endless metal bands, particularly for use as a driving belt, comprising the steps of arranging a plurality of bands approximately fitting around each other on a template adapted to the inner side of the innermost belt, tensioning the whole by means of the template and preserving the caused deformations by tempering, wherein the template is expanded to an extent at which each of the bands of the package is elongated and any play between the bands is removed.

3,922,772

METHOD FOR MANUFACTURING A HOLLOW-CYLINDRICAL BODY AND A HOLLOW-CYLINDRICAL BODY PRODUCED BY SAID METHOD

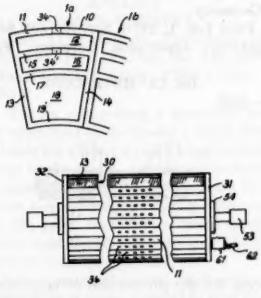
Sylve Jack Donald Ericsson, Fittja Industriomrade, 154 53 Norsborg, Sweden

Filed Jan. 15, 1974, Ser. No. 433,577

Claims priority, application Sweden, Jan. 17, 1973, 73006397

Int. Cl.² D21F *3/10*

U.S. Cl. 101—382 MV **16 Claims**



1. A method of producing a low-weight, rigid, hollow-cylindrical drum, which comprises

a. extruding a number of units each having the form of frusto-circular sectors, each of said sectors having at least two radially separated chambers extending the length of said sectors;

b. joining said sectors together in side-by-side relationship to form a cylindrical circus of said drum, each unit being joined to an adjacent unit by an adhesive agent; and

c. adhering an end wall at each end of said joined sectors to form a closed cylindrical drum having a plurality of closed radially separated chambers and an internal hollow cylindrical chamber, at least one of said radially separated chambers being arranged to communicate with a vacuum-generating means via holes disposed in at least one wall defining said chamber.

3,922,773

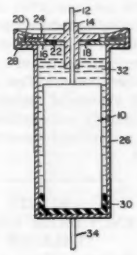
METHOD OF FORMING A HERMETIC ENCLOSURE

Jan A. Marien, Raleigh, N.C., and David R. Steinberg, Medfield, Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed July 17, 1974, Ser. No. 489,460

Int. Cl.² B01J *17/00*

U.S. Cl. 29—570 **12 Claims**



1. The method of forming an enclosure comprising the steps of

providing a silver container open at one end,

forming from said container material a unitary outwardly protruding flange at the open end of said container,

providing a lead,

sealing to said lead a quantity of sealing glass to form a bead about said lead intermediate the ends thereof,

providing a metallic member having an aperture therein,

sealing to the surface of the aperture bordering portion of said metallic member a coating of sealing glass,

fusing said glass bead to said glass coating, said lead being disposed within said aperture and extending therethrough and being spaced from said member,

disposing a silver ring on said surface of said metallic member intermediate said coating of sealing glass and the peripheral portion thereof,

folding said peripheral portion of said metallic member so that it engages a portion of said silver ring,

pressing said peripheral portion into said silver ring to form a compression seal therebetween, the inner portion of said silver ring remaining exposed after said pressing,

providing a device,

connecting said lead to said device,

disposing the assembly so formed in a manner so that said metallic member is adjacent said outwardly protruding flange of said container and said device is within said container, said lead extending from said device within said container to the exterior thereof,

folding said outwardly protruding flange over said metallic member so that said flange is in contact with said exposed inner portion of said silver ring, and

hermetically sealing said flange to said silver ring.

3,922,774

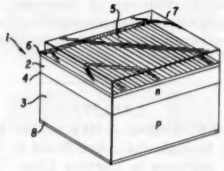
TANTALUM PENTOXIDE ANTI-REFLECTIVE COATING

Joseph Lindmayer, Bethesda, and James Frederick Allison, Silver Springs, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Continuation of Ser. No. 249,024, May 1, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 438,840

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—572 13 Claims



1. A method of placing an electrode and an anti-reflective non-crystalline tantalum pentoxide coating on a surface of a solar cell which is responsive to light, inclusively, in the blue-violet region of the spectrum, said method comprising the steps of:

a. forming a metallic collector electrode in contact with a first patterned part of said top surface,

b. depositing elemental tantalum on at least the part of said top surface other than said first patterned part, and

c. oxidizing said elemental tantalum under conditions to provide substantially non-crystalline tantalum pentoxide on at least the part of said top surface other than said first patterned part.

3,922,775

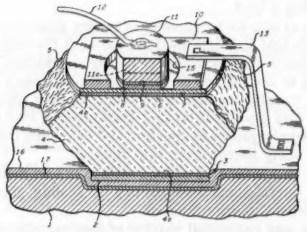
HIGH FREQUENCY DIODE AND MANUFACTURE THEREOF

Curtis N. Potter, Holliston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 396,960, Sept. 13, 1973, Pat. No. 3,872,496. This application Nov. 22, 1974, Ser. No. 526,095

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—589 5 Claims



1. The method of making an active high frequency semiconductor device including the steps of:

forming first and second opposed substantially flat polished surfaces on diamond heat conducting means,

coating said first and second polished surfaces, after cleaning, with respective first and second thin layers of metal having high electrical and thermal conductivities,

placing said first thin layer of metal against massive heat sink means,

placing preformed apertured plate means against said second thin layer of metal, and

simultaneously bonding under heat and pressure said first thin layer of metal to said massive heat sink means and said second thin layer of metal to said preformed apertured plate means substantially without disturbing said second thin layer of metal left exposed by the aperture in said preformed apertured plate means.

3,922,776

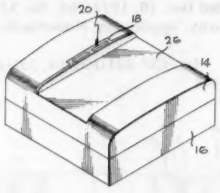
METHOD FOR MAKING NARROW TRACK FERRITE CORE FLYING PADS

James A. Alger, Torrance, and John J. Miyata, Monterey Park, both of Calif., assignors to VRC California, Inc., El Segundo, Calif.

Filed May 13, 1974, Ser. No. 469,309

Int. Cl.[2] G11B *5/42*

U.S. Cl. 29—603 8 Claims



1. A high yield method for manufacturing a narrow track width flying pad of the type comprising a ferrite core having a frontal portion of smaller width then a rearward portion, the core being ceramically bonded to a support piece, and the combined core and support piece having a finished surface for protectively approaching a moving magnetic record surface, comprising the steps of:

forming a groove adjacent to a core receiving opening in a support piece for providing a machining tool approach region;

bonding a generally planar ferrite core substantially perpendicular to a frontal surface of the support piece;

removing a portion of the ferrite generally parallel to the plane of the core and at an end of the core adjacent the frontal surface to form an effectively narrow track pole piece;

lapping the core generally parallel to the frontal surface to define a desired gap depth;

finishing the groove to define an air-bearing float level; and, contouring the frontal surface of the support piece to provide a magnetic medium protective air bearing surface.

3,922,777

PROCESS FOR THE PRODUCTION OF LAYER CIRCUITS WITH CONDUCTIVE LAYERS ON BOTH SIDES OF A CERAMIC SUBSTRATE

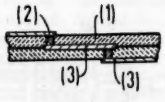
Artur Weitze, Pullach, and Peter Leskovar, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 1, 1974, Ser. No. 438,865

Claims priority, application Germany, Feb. 8, 1973, 2306236

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—628 5 Claims



1. A process for the production of layer-type printed circuits having conductive layers on both sides of a ceramic substrate which comprises providing an aperture in a green ceramic substrate, inserting into said aperture, a high melting

metal pin having incorporated therewith metal silicate, and thereafter sintering the green substrate under conditions to produce a solid state reaction between the ceramic and the silicate, the dimensions of said pin being such that the ends of said pin, upon shrinkage of said green substrate due to sintering, are flush with said sides.

3,922,778

DEVICE FOR CUTTING THE SIDEWALLS OF A BOX FOR SEPARATING WHOLLY OR PARTLY THE LID FROM THE BOX PROPER

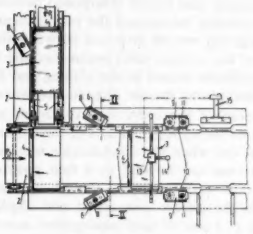
Marten Geert Aalpoel, Nuenen, Netherlands, assignor to Arenco-P.M.B. B.V., Best, Netherlands

Filed Apr. 10, 1074, Ser. No. 459,650

Claims priority, application Netherlands, Apr. 13, 1973, 7305176

Int. Cl.² B67B 7/38

U.S. Cl. 30—2 **11 Claims**



1. A device for cutting the sidewalls of a box for separating wholly or partly the lid from the box proper, said device comprising a conveyor passing the boxes past cutting members arranged at the side of said conveyor and detecting means for detecting the presence of complete cuts along a sufficient number of said sidewalls as to allow said separating of the lid, and an expelling member for expelling boxes whose lids cannot be separated, characterized in that the detecting means are formed by at least one blade spring having a feeler edge which can be inserted into a cut and clamped tight near one end of the edge, in that a member engages the blade spring at a distance from said edge and from the clamping area for bending the blade spring and in that a control element responding to a predetermined movement of the lid away from the box as effected bending of said blade by said member puts the expelling member out of operation.

3,922,779

CABLE STRIPPER

Joseph T. Cormier, 1130 Main St., Tewksbury, Mass. 01876

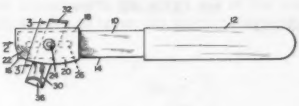
Filed Oct. 29, 1974, Ser. No. 518,459

Int. Cl.² B21F 13/00; B26B 27/02

U.S. Cl. 30—90.8 **5 Claims**

1. A cable stripper comprising a generally straight blade having a sharp edge, said blade having a cable slitting point at an end of the blade for slitting a cable longitudinally, a handle on the other end of the blade, a cable guide mounted on the blade in close association with the slitting point for guiding the cable as it moves longitudinally relatively with respect to said point, wherein the guide comprises a flared member at each side of the blade, said flared members extending away from the slitting point at each side thereof,

and a cable holder mounted on said blade, said cable holder being pivotable in a plane parallel to said blade thereon and including an offset end facing the slitting point and the cable guide, said offset end being adapted to engage the cable holding it in position in said guide and in stripping position with respect to said slitting point as the



latter and cable guide move longitudinally, relatively with respect to the cable.

3,922,780

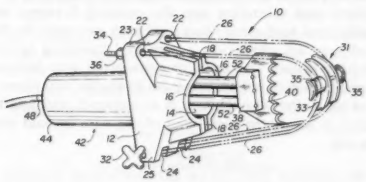
CABLE SPEARING AND CUTTING APPARATUS

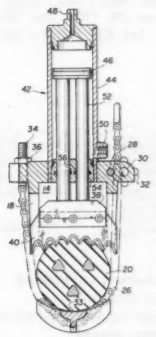
Cyril Robert Green, Woodside Park, Honesdale, Pa. 18431

Filed Nov. 4, 1974, Ser. No. 520,376

Int. Cl.² B23D 21/06; B26B 27/00; B26D 3/16

U.S. Cl. 30—92 **13 Claims**





1. An apparatus for spearing and cutting cables comprising a housing,

clamping means demountably secured to said housing and adapted for engaging the cable periphery,

prime mover means attached to said housing,

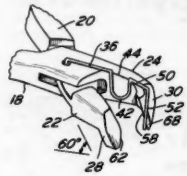
cutting means operable for relative movement with respect to said housing,

and a plurality of drive rod means on one end attached to said cutting means, and on the other end driven by said prime mover means so that as the cable is cut said plurality of drive rods serve to counteract torsional forces acting on and to limit twisting and flexing movements of said cutting means.

3,922,781
CUT AND HOLD PLIERS

William Tippy, 10131 Jeans St., Philadelphia, Pa. 19116

Filed Aug. 7, 1974, Ser. No. 495,508
Int. Cl.² B26B 17/04
U.S. Cl. 30—124 13 Claims

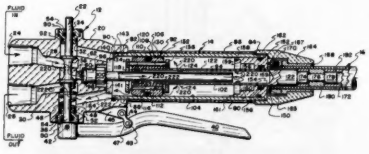


1. In a dental pliers of the type comprising two arms which are connected to each other by a pivot member to define two handles and two jaws, the improvement comprising, an anvil on one of said jaws and a cutting edge on said other jaw, said anvil and said cutting edge being cooperable to cut a wire, said cutting edge being defined by a face and camming surface, said camming surface being angularly disposed with respect to said anvil when said jaws are closed so that said camming surface and said anvil define a generally V-shaped opening, a resilient elongated member, said member including a means for coupling it to said pliers and a leg, said leg lying along said camming surface and extending into the opening between said cutting edge and said anvil when said jaws are open so that when said jaws are closed on a wire said camming surface urges said leg toward said anvil to engage the wire between said leg and said anvil before being cut to enable said pliers to be moved along the wire while it is so engaged, and said leg is operative to retain the distal end of the wire on said anvil after it is cut.

3,922,782
OPEN SYSTEM FLUID DRIVEN PRUNER

Michael A. Lind, Salt Lake City, Utah, assignor to New Draulics, Inc., Salt Lake City, Utah

Filed Nov. 29, 1974, Ser. No. 528,071
Int. Cl.² B26B 15/00
U.S. Cl. 30—228 1 Claim



1. A pruner mechanism comprising:

elongated support means;

anvil means carried by and exposed at the distal end of the elongated support means;

elongated reciprocable drive means substantially co-extensive with said elongated support means;

cutting blade means carried by and exposed at the distal end of the elongated reciprocable drive means, the cutting blade means being pivotable in respect to the anvil means whereby a cutting edge of the blade means engages the anvil means upon displacement of the drive means in one direction, the proximal end of the elongated reciprocable drive means being hollow for a length greater than the distance through which said reciprocation occurs and having port means therethrough;

a cylinder-piston assembly comprising hollow cylinder means anchored to the proximal end of the elongated support means and further comprising annular piston means reciprocable within the cylinder means and anchored to and reciprocable with the hollow proximal end of the elongated drive means, the piston means being located rearwardly of the port means, displacement of the piston means causing a corresponding displacement of the drive means;

manually operable control valve means carried adjacent the cylinder-piston assembly and having displaceable means for selectively communicating fluid under pressure along two of three flow paths at any point in time to and from either side of said piston means within the cylinder means;

hollow conduit means spanning between the displaceable means of the manually operable control valve means and the interior of the hollow proximal end of the elongated reciprocable drive means, the hollow conduit means being concentric within said proximal end and communicating fluid in respect to said hollow proximal end;

first annular seal means being interposed between the interior of the annular piston means and the exterior of the hollow conduit means;

second annular seal means interposed between the interior of the cylinder means and the piston means;

first passageway means disposed between the displaceable means of the control valve means and the hollow interior of the cylinder means at the trailing end thereof;

second passageway means disposed between the displaceable means of the control valve means and the hollow interior of the cylinder means at the trailing end thereof; whereby (*a*) when the displaceable means of the control valve means are located in a first position fluid under pressure is simultaneously though oppositely displaced between the piston means and said displaceable means through (1) one of said passageway means and (2) the hollow conduit means, and (*b*) when the displaceable means of the control valve means are located in a second position fluid under pressure is simultaneously though oppositely displaced between the piston means and said displaceable means through (3) the other of said passageway means and (4) the hollow conduit means;

said annular piston means carrying unbiased pressure responsive fluid valve means which reciprocate in respect to the annular piston means and then abut the ends of the cylinder means and thereby open at each extreme position along the path of reciprocation of the piston means between the ends of the cylinder means and close under force of fluid pressure exerting upon one side or the other of the piston means intermediate said extreme positions, the annular piston means comprising at least two bores through the annulus thereof defining front and back openings thereto each at opposite end faces of the piston means, one of said bores selectively communicating fluid across the piston means between a leading chamber of the cylinder means and a trailing chamber of the cylinder means, the bores being radially offset from the axial center line of the piston means about the same radial distance, the unbiased pressure responsive reciprocable fluid valve means comprising (*a*) at least one axially directed rod means reciprocably extending through one said bore and having ends exposed beyond the front and back openings thereof and (*b*) unbiased annular plate valve means respectively mounted to the opposed ends of the rod means in substantially parallel planes each substantially normal to the axes of the piston means and the two bores, the distance between the two unbiased annular plate valve means being substantially greater than the length of the two bores, the size, shape and dimensions of each unbiased annular plate valve means causing the plate valve means to cover and close the adjacent opening of the fluid communicating bore when said plate valve means is contiguous with the adjacent end of the piston means whereby the fluid communicating bore is always closed by one of the plate valve means during displace-

ment of the piston means between the ends of the cylinder means and opened upon butting either end of the cylinder means.

3,922,783

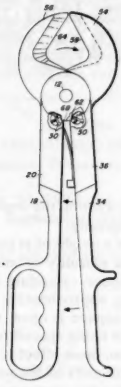
CUTTER EMPLOYING DUAL PAWL ACTION AND AUTOMATIC STOP AND RETURN MEANS

William H. Hayes, Helena, Ala., assignor to Efficiency Tool Company, Pelham, Ala.

Filed Aug. 22, 1974, Ser. No. 499,473

Int. Cl.² B26B *13/26*

U.S. Cl. 30—250 **13 Claims**



1. Cutting apparatus comprising:
a first handle assembly;
a first cutting blade carried by said first handle assembly;
a second cutting blade adjacent to, and having a common pivot axis with said first cutting blade;
a second handle assembly having a common pivot axis with said first and second blades;
first means carried by said second handle assembly for rotating said second cutting blade in one direction when said first and second handles are moved together; and
second means carried by said first handle assembly for preventing rotation of said cutting blade in a direction opposite to said one direction when said first and second handles are moved apart.

3,922,784

SWIVEL KNIFE FOR MANUAL OPERATION WITH BLADE HOLDER OFFSET SKEWABLY FROM HANDLE

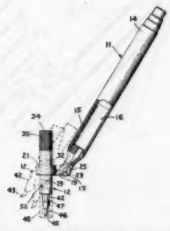
Michael J. Prince, New York, and Donald Marsden, Garden City South, both of N.Y., assignors to Diagravure Film Manufacturing Corporation, Brooklyn, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,678

Int. Cl.² B26B *1/04*

U.S. Cl. 30—317 **3 Claims**

1. A cutting instrument for manual operation and comprising:
an elongated handle having a handle axis and a front end,
a blade holder mounted skewably on the front end of the handle about a lateral axis that is normal to the handle axis,
means for fixing the holder in skewable relationship to the handle,
a blade with a shank for reception in the holder,
the holder being elongated and hollow and having a holder axis,
a rod mounted along the holder axis and rotatable about said holder axis,
an upper end of the rod being threaded and a lower end being slitted and the rod being provided near its lower slitted end with a cylindrical enlargement,
a thimble connected to the upper end of the rod with the thimble serving to retain the rod in the holder,



the lower end of the rod being threaded and tapered,
a bushing connectable screwably to the lower end of the rod,
the lower end of the rod and the bushing serving as a collet to hold the blade,
a cap engageable with the bushing whereby the cap is retained in place and whereby the cap serves for turning the bushing.

3,922,785

SAFETY DEVICES FOR ELECTRIC CIRCULAR SAWS

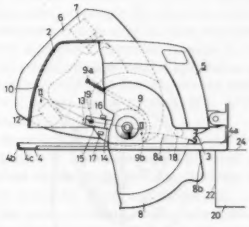
Fusao Fushiya, Nagoya, Japan, assignor to Makita Electric Works Limited, Aichi, Japan

Filed Nov. 12, 1974, Ser. No. 523,100

Claims priority, application Japan, Nov. 15, 1973, 48-128533

Int. Cl.² B27G *19/04*

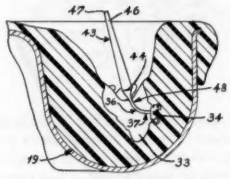
U.S. Cl. 30—391 **10 Claims**



1. In combination with a safety device for an electrically driven hand operated circular saw, wherein a safety cover for a circular saw blade is provided rotatably in one direction to expose said saw blade and in the opposite direction to conceal said saw blade, and wherein means is provided for urging said safety cover in said opposite direction, the improvement which comprises:
an auxiliary switch connected in series to a main switch in an electric circuit between a power source and a motor for driving said saw blade; and
means operationally associated with said safety cover and said auxiliary switch for maintaining said auxiliary switch in its operative position during rotation of said safety cover in said one direction, but turning said auxiliary

switch into its inoperative position upon rotation of said safety cover in said opposite direction.

3,922,786
METHOD AND APPARATUS FOR FORMING AND FITTING ORTHODONTIC APPLIANCES
Joseph L. Lavin, S. 525 Bernard St., Spokane, Wash. 99204
Filed Jan. 30, 1974, Ser. No. 437,810
Int. Cl.² A61C *13/00*
U.S. Cl. 32—11 **16 Claims**

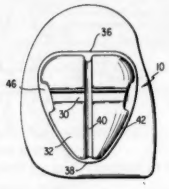


13. An orthodontic apparatus for connecting with an orthodontic bracket for use in the formation of orthodontic archwires, comprising:

a root stem; and

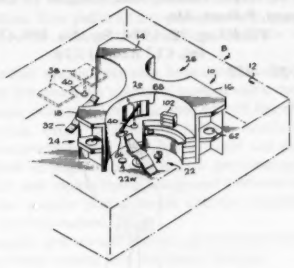
a bendable interconnecting member affixed to one end of the root stem and extending outward therefrom terminating in a remote end for operatively interconnecting an orthodontic bracket to the root stem to enable the root stem to be angularly positional with respect to the orthodontic bracket to position the root stem along the axis of a tooth in the preparation of a working model; and said interconnecting member having an enlarged attachment fixture at the remote end for facilitating attachmet of the interconnecting member to the orthodontic bracket.

3,922,787
PLASTIC ORTHODONTIC BRACKET
Kenneth J. Fischer, 18925 Vose St., Reseda, Calif. 91335, and Jan A. Orlowski, 1304 Rubio St., Altadena, Calif. 91001
Filed May 7, 1974, Ser. No. 467,675
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 A **14 Claims**



7. A plastic orthodontic bracket comprising a base portion which is adapted to be attached to the labial surface of a tooth between the gingival and incisal sections and a body which is joined to said base, said body having a front surface which is quasi-triangular shaped for minimizing the forces exerted on said bracket during mastication and occlusion when said bracket is attached to said tooth so that the apex of said quasi-triangular shaped front surface is positioned closest to the incisal section of a tooth and the base of said quasi-triangular shaped front surface is positioned closest to the gingival section of the tooth.

3,922,788
WORKSPACE STRUCTURE
James E. Rota, Los Angeles, Calif., assignor to Ergonamic Environments, Inc., Los Angeles, Calif.
Filed July 13, 1973, Ser. No. 379,051
Int. Cl.² A61C *19/02*
U.S. Cl. 32—22 **8 Claims**

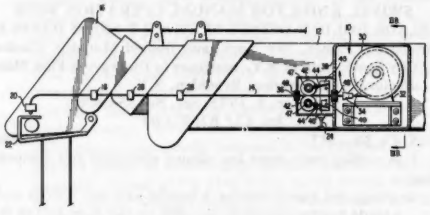


1. In a building having a room, the improvement of a dental operatory structure comprising:

a partition structure of a height of at least 5½ feet for dividing the room into a plurality of major workspaces, the wall of each workspace extending in a small radius of curvature extending approximately 180° so that about one-half of the workspace is open, the opposite ends of each workspace wall being spaced from the side walls of the room to create an open effect to a patient positioned between the opposite ends of the workspace wall and to provide a corridor for the dentist in moving between the workspaces, a first and second of said workspaces having walls whose ends lie adjacent to one another so that as a dentist passes by one of said wall ends into the corridor, he enters the other workspace within a few steps; and

a patient-holding chair mounted between the opposite ends of the workspace to provide an open effect to a patient in the chair.

3,922,789
BOOM LENGTH SENSING SYSTEM WITH TWO-BLOCK CONDITION SENSING
Ivan D. Sarrell, Rising Fawn, Ga., assignor to Koehring Company, Milwaukee, Wis.
Filed Dec. 11, 1974, Ser. No. 531,707
Int. Cl.² G08B *21/00*
U.S. Cl. 33—125 R **17 Claims**



1. Apparatus for sensing the length of an extendible boom of a crane comprising:

a reel mounted for rotation on a nonextending portion of the crane boom, said reel being electrically insulated from said boom;

an electrically conductive cable having a substantially uniform resistance per unit length thereof, one end of said cable being secured to and electrically connected to the

uppermost movable section of the crane boom and the other end of said cable being wound on said reel;

biasing means for biasing said reel in a direction of rotation tending to wind said cable onto said reel;

means mounted on said nonextending portion of the crane boom adjacent said cable for electrically contacting said cable and providing a moving electrical contact with said cable;

means for applying current to said contacting means to thereby apply said current through a length of said cable between said contacting means and said one end of said cable; and,

circuit means for sensing a resistance value for said length of said cable between said contacting means and said one end of said cable in response to said current flowing therethrough, and for providing a manifestation of the length of the crane boom as a function of the sensed resistance of said length of said cable between said contacting means and said one end of said cable.

3,922,790

LINEAR MEASURING INSTRUMENT

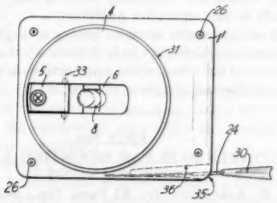
Michel Quenot, Besancon, France, assignor to Stanley-Mabo, Besancon, France

Filed Apr. 18, 1974, Ser. No. 461,849

Claims priority, application France, Apr. 20, 1973, 73.14643

Int. Cl.² G01B 3/10; G05G 1/12

U.S. Cl. 33—138 **17 Claims**



1. A tape measure assembly comprising

a. a casing

b. a winding drum mounted within the casing for rotation about a pivot axis and constituted by a side plate having a slot on one face and a central boss on the other face, the slot being defined by a base and opposed lateral walls provided with housings and adjacent recesses extending along said walls

c. a graduated tape secured at one end to the central boss for winding thereon.

d. means for effecting a braking action on the drum

e. means for rotating the drum about its pivot axis and constituted by

i. a crank

ii. two lugs integral with the crank and extending in opposite directions to engage in the housings to define a pivot about which the crank can be moved between operative and inoperative positions

f. means for removably retaining the lugs in their housings and constituted by a resilient part of the slot base in the form of a tongue having a free end portion adjacent the housings and the recesses and adapted to resiliently yield to permit mounting of the lugs along the recess and into the housings, the free end portion of the tongue being directed towards the centre of the side-plate, the tongue being defined by an apertured slit passing through the base of the slot adjacent said recesses, the recesses communicating with the housings to permit passage of the lugs therebetween and the free end of the tongue bearing against the inner face of the crank to retain the lugs in the housings and permit removal therefrom.

3,922,791

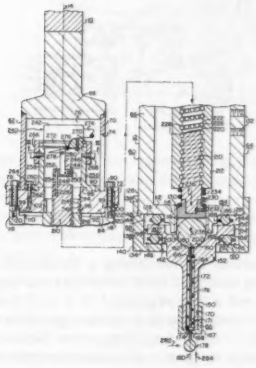
PROFILE INDICATING APPARATUS DISPLACEABLE EITHER ALONG AN AXIS OR IN A PLANE PERPENDICULAR THERETO

Robert E. L. Maxey, Sr., North Huntingdon, and John Bernard, Jr., Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 16, 1974, Ser. No. 506,650

Int. Cl.² G01B 5/20, 7/28

U.S. Cl. 33—172 R **6 Claims**



1. An apparatus having an axis extending therethrough for indicating the contour of a member having a surface disposed perpendicular to the axis and a surface disposed parallel to the axis, said apparatus comprising:

a housing having an opening therein,

sensing means for interrogating both the perpendicular and the parallel surfaces of the member, said sensing means comprising,

a probe member coaxially mounted within said housing and extending through the opening therein,

means disposed within said housing for permitting movement of said probe member relative to said housing in a plane perpendicular to the apparatus axis,

a pin member mounted for movement within said probe member along the apparatus axis, said pin member terminating in a probe tip,

said pin member being displaced along the apparatus axis in response to a force exerted on said probe tip by a deviation on the perpendicular surface of the member as said probe tip is moved thereover,

said probe member being displaced relative to said housing the plane perpendicular to the apparatus axis in response to a force exerted on said probe tip by a deviation on the parallel surface of the member as said probe tip is moved thereover,

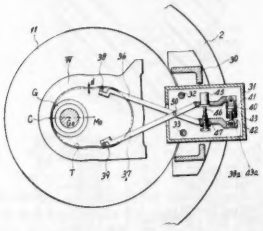
a shaft member mounted coaxially within said housing and displaceable along the apparatus axis,

force transmission means for transmitting forces imposed upon said sensing means to said shaft member to displace said shaft member from a first to a second position along the apparatus aixs, said shaft member being mounted for simultaneous rectilinear and rotational displacement relative to the apparatus axis in response to a force transmitted thereto by said force transmission means, and,

means for indicating the magnitude of the displacement of said shaft member to indicate the magnitude of the devia-

tion encountered by said sensing means on the surface of the member.

3,922,792
GAUGING APPARATUS FOR WORKPIECE WITH TROCHOIDAL CROSS SECTION
Teruyuki Ito, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Japan
Filed Feb. 5, 1974, Ser. No. 439,694
Claims priority, application Japan, Feb. 21, 1973, 48-21038
Int. Cl.² G01B *5/20*
U.S. Cl. 33—174 R **8 Claims**



1. In an apparatus for machining a trochoidal bore of a workpiece having inner and outer envelopes and supported on a work spindle and a tool supported on a tool spindle being disposed so as to contact said workpiece at a first point of a plurality of predetermined boundary points disposed between said inner and outer envelopes, the improvements comprising: a basic member;

a rotating member rotatably mounted within said basic member;

said work spindle being rotatably mounted within said rotating member with a predetermined eccentricity with respect thereto for supporting said workpiece in axial alignment with said work spindle;

trochoid generating drive means operatively connected with said rotating member and said work spindle for rotating said rotating member and said work spindle about their own axes with a predetermined rotational ratio therebetween and for revolving said work spindle about the axis of said rotating member, whereby a trochoidal motion is imparted to said work spindle and said workpiece supported thereon and draws the inner and outer envelopes of a trochoidal bore upon rotation of said work spindle by said trochoid generating drive means; and

sizing means fixedly disposed on said basic member and being provided with feeler means for detecting the dimensions of said trochoidal bore of said workpiece by engaging said feeler means with said bore at at least a second point of said boundary points disposed between said inner and outer envelopes of said trochoidal bore while said workpiece is being rotated.

3,922,793
LAND MEASURING INSTRUMENT
Ebenhard S. Gandrud, P.O. Box 528, Owatonna, Minn. 55060
Filed Oct. 29, 1974, Ser. No. 518,238
Int. Cl.² G01B *3/12*
U.S. Cl. 33—141 E **7 Claims**

1. A land measuring instrument comprising:

a. a wheel supported body;

b. a ground engaging wheel of given diameter;

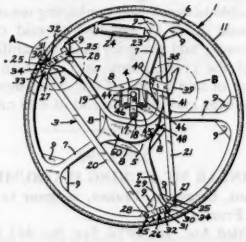
c. spindle means journalling the wheel on said body for rotation on a normally generally horizontal axis;

d. a counter carried by said body;

e. actuator means operatively connected to said wheel for operating said counter responsive to rotation of the wheel;

f. wheel guiding and impelling means connected to said body and comprising an elongated shank having a handle at one end, said shank including a least a pair of shank sections in end to end relationship;

g. means connecting said shank sections at adjacent ends thereof for movements relative to each other between inoperative collapsed positions and operative positions in aligned end to end relationship, and comprising toggle

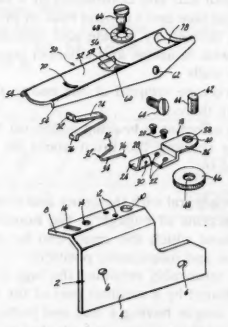


links having inner ends pivotally secured together on an axis extending transversely of the shank, and outer ends each pivotally connected to the adjacent end of a different shank section on an axis parallel to said transversely extending axis;

h. and means for releasably locking said shank sections rigidly in said operative positions;

i. each of said shank sections having a length and shape to be confined within a circle defined by the outer circumference of the wheel when said sections are in said inoperative collapsed positions thereof.

3,922,794
ADJUSTABLE BASE FOR MOUNTING AN OPTICAL FIREARM SIGHT
William R. Ackerman, Jr., El Paso, Tex., assignor to W. R. Weaver Company, El Paso, Tex.
Filed Oct. 4, 1974, Ser. No. 512,833
Int. Cl.² F41G *1/38*
U.S. Cl. 33—248 **3 Claims**



1. A gunsight mount of the type having windage and elevation adjustment capabilities, said mount comprising:

a. a fixed member adapted to be fixed to a firearm;

b. a pivotable cradle providing a surface upon which a sight can be mounted;

c. means forming a single pivot for said pivotable cradle, said pivot enabling said pivotable cradle to be pivoted

both in a horizontal and a vertical direction with respect to said fixed member;

d. first spring means engaging said pivotable cradle for biasing the latter vertically about said pivot;

e. first drive means engaging said pivotable cradle for imparting vertical pivoting movement to said pivotable cradle about said pivot against the bias of said first spring means;

f. second spring means engaging said pivotable cradle for biasing the latter horizontally about said pivot; and

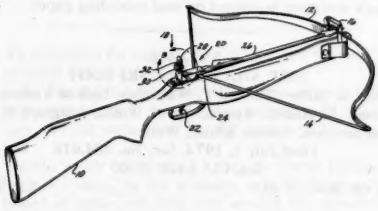
g. second drive means engaging said pivotable cradle for imparting horizontal pivoting movement to said pivotable cradle about said pivot against the bias of said second spring means.

3,922,795

PEEPSIGHT

Pierre Andre Bettencourt, Duarte, Calif., assignor to Wham-O Mfg. Co., San Gabriel, Calif.

Filed Aug. 12, 1974, Ser. No. 496,475
Int. Cl.² F41G 1/08, 1/22, 1/46
U.S. Cl. 33—254 **8 Claims**



1. In a sighting and aiming device having a sight bracket, an elongated slot in the sight bracket, and means for mounting the bracket on the implement with which the device is used, the improvement comprising

a peepsight having a cone portion;

An integrally formed neck portion extending from the apex of the cone portion and generally axially thereof;

a pair of wing members integrally formed with the neck portion at the end thereof opposite the cone portion, each of the wing members extending in diametrically opposite directions transversely of the axis of the cone portion, and a sighting aperture concentric with the axis of the cone portion extending through the wing members, neck portion and opening into the cone portion.

3,922,796

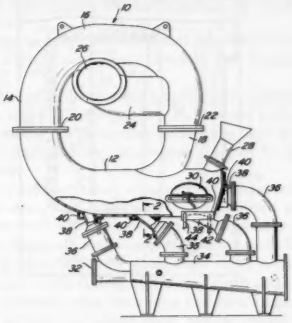
DRYING MILL FOR WET GRANULAR MATERIAL

Nicholas N. Stephanoff, Haverford, Pa., assignor to Fluid Energy Processing & Equipment Co., Hatfield, Pa.

Filed Oct. 25, 1974, Ser. No. 517,849
Int. Cl.² F26B 3/08
U.S. Cl. 34—10 **11 Claims**

1. A method of drying wet solid particles which comprises propelling a hot gaseous fluid from at least one gaseous fluid inlet thereof into a circulating path, passing said wet solid particles into said circulating gaseous fluid from a separate particle feed means, said gaseous fluid being initially at a temperature at least approximately the deterioration temperature of said particles, said gaseous fluid acting to simultaneously disperse said particles and apply drying heat to their exposed surfaces upon contact therewith, the particles being thereafter centrifugally separated in accordance with their state of dryness while being moved by said gaseous fluid through said circulating path, and maintaining the area surrounding said fluid inlet at a temperature that is lower than the temperature of said gaseous fluid.

9. A drying mill comprising an inlet section, an upstack, section, a classification section and a downstack section, said sections forming a substantially annular path, said inlet section having particle feed means for heat sensitive wet, granular particles and at least one gaseous fluid inlet separate from said feed means and arranged tangentially to the axis of said inlet



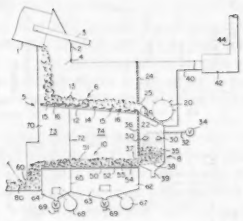
section, means to pass hot gaseous fluid through said fluid inlet into said inlet section, and cooling means for cooling the area around said fluid inlet to a temperature below the melting point of the material being treated while said hot gaseous fluid is being propelled therethrough, whereby clogging of the fluid inlet is prevented.

3,922,797

METHOD FOR COOLING HOT PARTICULATE MATERIAL

Charles J. Dick, Bethlehem, Pa., assignor to Fuller Company, Catasauqua, Pa.

Division of Ser. No. 327,967, Jan. 30, 1973, Pat. No. 3,839,803. This application July 18, 1974, Ser. No. 489,689
Int. Cl.² F26B 7/00; F27D 15/02
U.S. Cl. 34—20 **6 Claims**



4. The method of cooling hot particulate material comprising the steps of:

passing a cooling gas through the material to be cooled;

further cooling said material by directly contacting said material with a liquid while substantially preventing the passage of a cooling gas therethrough; and

passing a cooling gas through said material.

3,922,798

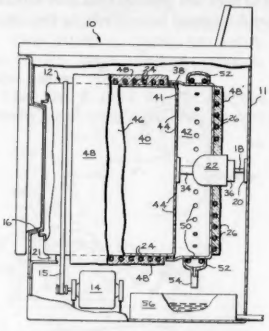
CLOTHES DRYER

Stephen L. McMillan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 19, 1974, Ser. No. 498,267
Int. Cl.² F26B 21/06
U.S. Cl. 34—73 **5 Claims**

1. In an improved clothes dryer, a rotatable drying drum, power means for rotating the drum, a compressor, a con-

denser connected to the compressor and associated with the drying drum for supplying heat thereto, and an evaporator connected to the compressor and the condenser forming a refrigeration cycle, the improvement comprising:



said compressor, condenser and evaporator each having means for being fixedly connected to the drying drum and rotatable therewith and including means for operating the compressor.

3,922,799

EDUCATIONAL EXERCISING APPARATUS

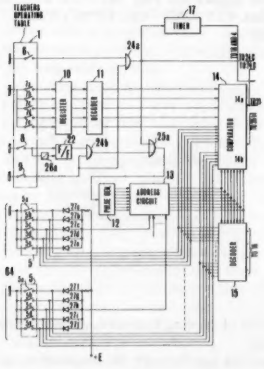
Mikiharu Tanji, Mie, Japan, assignor to Ise Electronics Corporation, Ise, Japan

Filed Oct. 31, 1973, Ser. No. 411,288

Claims priority, application Japan, Nov. 8, 1972, 47-111805; Nov. 8, 1972, 47-111806; Nov. 8, 1972, 47-111807

Int. Cl.[2] G09B *5/00*

U.S. Cl. 35—48 R **5 Claims**



1. An educational exercising apparatus for use in conjunction with some means for presenting a problem, said apparatus comprising a teacher's station including a plurality of correct answer switches for producing answer signals corresponding to the correct answers of the presented problems, a recorder including recording paper and recording means, a plurality of student answerer units each including a plurality of select buttons operated by each answerer for producing difference select numbers, a comparator for sequentially comparing the select numbers of the answer units operated by respective answerers with an answer signal produced by one of said correct answer switches to produce different binary signals according to whether the answers provided by respective answerers are correct or not, means responsive to the output from said comparator for recording on said recording paper individual correct and erroneous answers for each answerer with different colours, a timing pulse generator for producing a plurality of timing pulses of the number equal to the number of the answerers, an address circuit responsive to said timing pulses for selecting the answer units operated by respective answerers to produce address pulses of said selected answer units, a first decoder responsive to said address pulses for decoding the select numbers produced by said answer units into different data signals, means for supplying said data signals to said recording means for recording on said recording paper the select numbers of the answers produced by said student answerer units, a selectively operable group select switch provided in said teacher's station, a second timer operated by said group select switch for producing a pulse at each unit time, percentage counter means responsive to the pulses from said second timer and said comparator for deriving a percentage count output signal indicative of the number of the binary signals produced by said comparator representing correct answers, an address setter responsive to the output signal from said percentage counter means for designating an address on said recording paper, a second decoder responsive to the output from said percentage counter means for printing a predetermined symbol on said recording paper at said designated address, whereby the percentage of the correct answers in each unit time is printed on said recording paper.

3,922,800

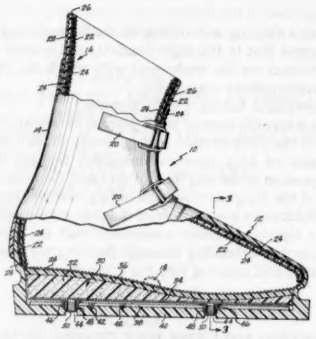
SIZE ADJUSTABLE SKI BOOT

Forrest A. Miller; Michael T. Wirsching, both of Vashon, and Frank A. Hosick, Burton, all of Wash., assignors to K-2 Corporation, Vashon Island, Wash.

Filed July 1, 1974, Ser. No. 484,618

Int. Cl.[2] A43B *00/00*

U.S. Cl. 36—2.5 AL **13 Claims**



1. A ski boot having a molded plastic outer shell including: a first member having an ankle portion, a heel portion, a sole portion and instep and toe portions of fixed external size;

a cuff member affixed to said first member and including fastener means holding said cuff member in surrounding relation to said ankle portion;

an insole sized to fit within said first member and substantially cover the bottom thereof including metal plate means on the bottom of said insole;

opening means in said plastic shell;

means for moving said insole vertically with respect to the sole portion of said first member to change the foot size of said ski boot, said means being accessible for actuation from without said plastic shell through said opening means while said boot is being worn;

slow memory expanded foam padding positioned adjacent the top and side surfaces of the instep portion of said first member, said padding adapted to be compressed by

movement of said insole or the wearer's foot thereagainst with small resilient resistance; and

said slow memory expanded foam padding being of the closed cell vinyl type having a compression set value C_f of between 15 and 45% and a compression set value C_d of between 45 and 75%.

3,922,801

LIQUID FILLED ORTHOPEDIC APPARATUS

Patrick Thomas Zente, 34 Nance Road, West Orange, N.J. 07052

Filed July 16, 1973, Ser. No. 379,726
Int. Cl.² A43B *13/40*
U.S. Cl. 36—44 **7 Claims**

1. An apparatus for treating foot defects and for promoting foot comfort which comprises:

flexible, liquid-filled ampules, at least one separate ampule being provided and positioned to support each of (a) the toes, (b) the metatarsal, (c) the arch, and (d) the heel; and

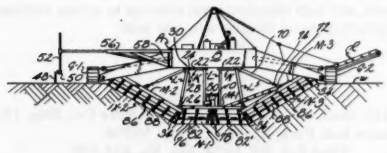
a flexible upper lamina and a flexible lower lamina, the laminae containing the ampules, and the laminae being sealed at their periphery and around the perimeter of each of the ampules, thereby permanently positioning the ampules and forming the apparatus.

3,922,802

EARTH SURFACING APPARATUS

Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306

Filed Nov. 25, 1974, Ser. No. 526,849
Int. Cl.² E02F *5/04*, *5/08*
U.S. Cl. 37—97 **9 Claims**



1. An earth surfacing apparatus capable of excavating a flat longitudinally extending swath in the earth or a swath that includes a flat section that has at least one side section extending upwardly at an angle from one end of said flat section, said apparatus including:

a. a platform having a forward and rearward end;

b. first means on said platform that is power operated for supplying hydraulic fluid under pressure;

c. control means for supplying said hydraulic fluid from said first means;

d. first and second laterally spaced parallel crawler track assemblies disposed on opposite sides of said platform that are actuated by said hydraulic fluid supplied thereto from said control means;

e. first and second pairs of parallel, longitudinally spaced arms that are pivotally connected to said first and second crawler track assemblies and to said platform;

f. second means operated by said hydraulic fluid from said control means for pivoting said first and second pairs of arms relative to said platform;

g. third means operated by said hydraulic fluid from said control means for pivoting said first and second crawler track assemblies relative to said first and second pairs of arms to permit lower reaches of said crawler track assemblies to fully engage the earth surface on which they are supported;

h. a transverse frame assembly that depends from said platform intermediate said forward and rearward ends thereof;

i. a plurality of struts that are longitudinally adjustable as to length, said struts having first and second ends;

j. fourth means for removably connecting said first ends of said struts in desired transverse spacing to said frame assembly;

k. first and second frames supported from said second ends of said strut, said first frame being disposed under said platform in a substantially horizontal position, and said second frame disposed outwardly from said first frame and extending upwardly at an angle relative thereto;

a. first rotary earth cutting and lateral earth cutting moving means rotatably supported from said first frame, said first rotary cutting and lateral earth moving means when rotated delivering said cutting rearwardly substantially the center thereof;

m. second rotary earth cutting and lateral earth cutting moving means rotatably supported from said second frame and when rotated delivering cuttings cut thereby to a first end of said first rotary earth cutting and lateral earth cutting moving means to be moved by the latter rearwardly from substantially the center thereof;

n. fifth means actuated by said hydraulic fluid from said control means for rotating said first and second rotary earth cutting and lateral earth cutting moving means;

o. a longitudinally disposed upwardly and rearwardly extending first conveyor for receiving said cutting from said first rotary earth cutting and lateral earth cutting moving means on a first end thereof and discharging said cutting from a second end thereof;

p. sixth means for supporting said first conveyor from said frame assembly;

q. a transversely positioned angularly disposed second conveyor having first and second ends, said cuttings being delivered from said second end of said first conveyor onto said first end of said second conveyor, and said cuttings when said second conveyor is operating being conveyed thereon to said second end thereof from which they drop by gravity;

r. swivel means for movably supporting said second conveyor adjacent said first end thereof from said platform;

s. movable cable means supported from said platform and secured to said second conveyor adjacent said second end thereof for angularly adjusting said second conveyor relative to said platform; and

t. seventh means for driving said first and second conveyors, with said device as it moves forwardly on said first and second crawler track assemblies cutting said swath in the earth and delivering said cuttings to one side thereof from said second end of said second conveyor.

3,922,803

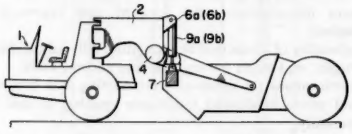
SUSPENSION DEVICE FOR THE BOWL OF A SCRAPER

Haruhiko Umeda, Yokohama; Michio Suga, and Akio Iida, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 30, 1975, Ser. No. 545,497
Claims priority, application Japan, Apr. 8, 1974, 49-39063
Int. Cl.² E02F *3/86*
U.S. Cl. 37—126 R **3 Claims**

1. In a suspension device for the bowl of a scraper having a goose neck horizontally swingably mounted on the scraper,

draft arms vertically swingably supported by said goose neck at their proximal ends, said draft arms swingably supporting said bowl at their distal ends, and a pair of lift cylinder assemblies arranged at the left and the right side with respect to the center of the scraper body and connected to said goose neck and said bowl, respectively, for controlling the operation of said bowl, the improvement wherein one ends of said pair of



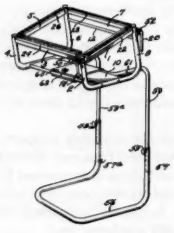
lift cylinder assemblies are connected through spherical bushes to the upper rear portion of said goose neck at positions relatively close each other and the other ends of said lift cylinder assemblies are connected through spherical bushes to a cross member spanning laterally said bowl at positions adjacent to the opposite ends of said cross member whereby said lift cylinder assemblies extend obliquely.

3,922,804

RUG HOOKING FRAME CONSTRUCTION FOR SUPPORTING AND STRETCHING A HOOKED RUG FABRIC

Thomas E. Batey, Weston, Mass., assignor to Mayflower Textiles Co., Inc., Franklin, Mass.

Filed Oct. 10, 1974, Ser. No. 513,557
Int. Cl.² D06C *3/08*
U.S. Cl. 38—102.91 **7 Claims**



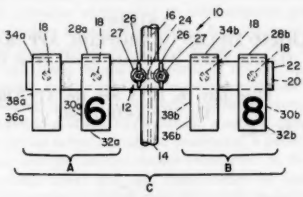
1. Apparatus for supporting and stretching a hooked rug fabric, said apparatus comprising a rug hooking frame, post means arranged in the underside of the frame for locating corner portions thereof in a raised position, said rug hooking frame including four fabric retaining bars positioned at right angles to one another and having secured at the upper sides thereof respective card clothing holders, card clothing strips detachably received in the holders for engaging and stretching a rug fabric, two of the retaining bars being secured to the post means in fixed relation therewith, the remaining two retaining bars being mounted in the post means for rotative movement independently of one another in clockwise directions, handle means for turning the rotatable bars separately of one another and locking means responsive to movement of the handles to resist counterclockwise movement of respective rotatable bars in any position of adjustment.

3,922,805

VOLLEYBALL SCORE DISPLAY DEVICE

Gloria A. Krug, R.D. No. 5, Hanover, Pa. 17331

Filed July 10, 1974, Ser. No. 486,971
Int. Cl.² G09F *7/18*
U.S. Cl. 40—102 **2 Claims**



1. A score display device for volleyball games comprising in combination, two sets of pairs of multiple flexible score indicia panel members substantially longer than the width thereof, each set comprising a left-hand group of limited number of such members displaying the ten digits of the score of one team and a right-hand group of ten panel members bearing in succession numerical digits from one to nine and zero, said panel members being thin and flexible and formed from durable sheet material of synthetic resin, a pair of rigid clamping bars adapted to be mounted horizontally, bolt-like members extending through said bars and the upper ends of said groups of flexible score indicia panel members to clamp the same securely between said clamping bars with said sets of panel members respectively being positioned at opposite sides of the midpoint of said bars and the left-hand group of each set being located to the left of the right-hand group of each set when positioned in use, said sets of panel members initially extending upward, across and hanging downward in use from one side of said bars to display the indicia thereon in depending manner and each group of panel members initially having a blank panel member outermost, the flexibility of said members permitting the same readily to be flipped backward in use over the top of said bars and the length thereof being sufficient to enable the weight of said members to insure that said members will hang downward on the opposite side thereof to reveal on the next adjacent member the next indicia corresponding to the score of the teams, a U-bolt having legs extending through holes in the midpórtion of said bars and adapted to be mounted upon a vertical pole at one end of the net of a volleyball court, and nuts threaded upon said legs to secure said bars and depending panel members to said pole.

3,922,806

PICTURE FRAME

Michel H. Saad, c/o Dana Electronic Computer Co., Bldg. 105, Spokane Ind. Park, Spokane, Wash. 99216

Filed Feb. 25, 1974, Ser. No. 445,130
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152 **3 Claims**

1. A picture frame assembly for canvas pictures comprising: a plurality of mitered ends to define an opening between the members;

said frame members having outside peripheral edges;

said frame members having inside edges spaced inwardly from the outside edges bordering the opening and sub-

stantially parallel to the outside edges along respective frame members;

said frame members having a rear face extending between the inside and outside edges intended to face a wall;

said frame member having a front face extending between the inside and outside edges intended to face outward from the wall;

a canvas fastening groove formed in the rear face intermediate the inside and outside edges, extending substantially parallel to the inside edges for receiving the boundary of a canvas picture;

a beveled canvas tightening groove formed in the rear face intermediate the fastening groove and the inside edges extending substantially parallel to the fastening groove forming a friction ridge intermediate the fastening groove and the canvas tightening groove.

said beveled canvas tightening groove forming a groove base surface and a beveled groove side surface extending at shallow inclined angle from the groove base toward the inside edges terminating at an inside back surface of the rear face;

said inside back surface extending from the canvas tightening groove to the inside edges;

a fastening means for fastening the boundary of the canvas picture to the frame members within the fastening groove with the canvas spaning the opening and covering the friction ridge and the canvas tightening groove; and

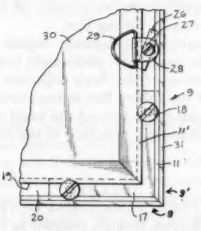
canvas tightening means for pressing the canvas sheet adjacent the tightening groove into the beveled tightening groove to wrap the canvas sheet over against the friction ridge to minimize stress of the canvas in the fastening groove and to uniformly stretch the canvas outward over the inside back surface and into the beveled tightening groove and for securing the canvas sheet to the base surface of the tightening groove with the canvas sheet taut over the opening and firmly engaging the inside back surface.

3,922,807

MULTI-UTILITY DURABLE MITERED PICTURE FRAME

Frank Shore, 305 W. 28 St., New York, N.Y. 10001

Filed Jan. 31, 1974, Ser. No. 438,238
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152.1 **11 Claims**



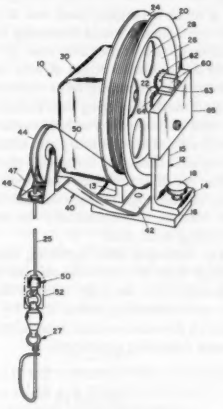
1. A picture frame device comprising in combination: outer frame pieces mitered at opposite corner-ends thereof and thereby joinable to one-another at the ends thereof to form a corner frame assembly, each outer frame piece defining an outer side wall and a front wall, a cross-section through the outer frame and the outer side wall and the front wall thereof being in a shape of an inverted "L" with the front wall extending inwardly defining a base flange as a base to the inverted L at a front of the outer frame piece; and each outer frame piece further including additional second laterally inwardly-extending flange and third laterally inwardly-extending flange, the second and third laterally inwardly-extending flanges extending from said outer front wall, the second and third laterally inwardly-extending flanges being substantially parallel to each other and to the base flange, and the second and third laterally inwardlyextending flanges being spaced behind the base flange, the third laterally inwardly-extending flange being spaced behind the second flange and being short relative to each of the base flange and the second flange, the second flange continuing in structure and shape to form in conjunction with the third flange a T-shaped slot as viewed in said cross-sectional view, the second and third flanges both extending from about a mid-point along the upright portion of the inverted L shape of said outer side wall structure whereby joined metered ends of a corner frame assembly when joined have opposite portions on opposite positions from the mid-point braced against the corresponding portions of a joined other outer frame, with the mid-point of each joined piece serving as a pivot point, each outer frame piece being sturdy and rigid.

3,922,808

CONTROLLED TROLLING APPARATUS

James E. Rieth, Grand Rapids, and William M. Booth, Grand Haven, both of Mich., assignors to James E. Rieth, Grand Rapids, Mich.

Filed Jan. 11, 1974, Ser. No. 432,599
Int. Cl.² A01K *89/00*
U.S. Cl. 43—4 **13 Claims**



1. A powered trolling apparatus for use on a vessel comprising:

a frame member;

a reel mounted to said frame member and including a control line coupled thereto;

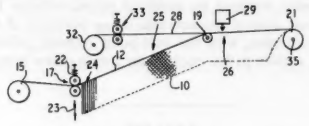
a reversible electric motor coupled to said reel for paying out and retrieving said control line from said reel such that an end of said control line can be immersed in the water;

means for detecting the temperature of water at a reference point on said control line; and

a temperature control circuit coupled to said detecting means and to said drive means for actuating said drive means to pay out or retrieve said control line wherein said temperature control circuit includes means for providing selectable electrical reference signals representative of upper and lower temperature limits, and comparator means coupled to said detecting means, to said providing means and to said drive means for developing electrical signals applied to said drive means to actuate said drive means when the detected water temperature is above or below said upper or lower limits, respectively, to raise or lower said reference point on said control line in the

water to maintain said reference point on said control line within said temperature limits.

3,922,809
PROCESS FOR PRODUCING NET DEVICES
Jan H. Platou, Birkelundsbakken 76, 5040 Paradis, Norway
Filed Jan. 21, 1975, Ser. No. 542,768
Int. Cl.² A01K *73/00*
U.S. Cl. 43—7 **6 Claims**



1. A process for producing net devices by mechanically mounting floating line means for the reception of floating material and sinking line means for the reception of weight-increasing material at local fastening points along opposite side edges of a line of netting by way of fastening lines associated with the latter which comprises the steps of:

a. drawing the line of netting intermittently in a path through a mesh-diverging zone and a subsequent fastening zone controlled by said fastening lines each of which passes through its respective one of opposite rows of meshes at the opposite edges of said line of netting,

b. maintaining said fastening lines constantly stretched out in both said mesh-diverging and fastening zone,

c. causing said edge meshes in said mesh-diverging zone to be drawn freely in an upwardly and obliquely rising movement along said fastening lines whereby the weight of said netting has the effect of both ensuring a desired degree of spreading of said edge meshes on said lines and maintaining said meshes undisplaceably in position thereon in said fastening zone, and

d. separately fastening said fastening lines to said floating and sinking lines respectively at said fastening points in said fastening zone, the edge meshes thus being anchored between said fastening points and by way of the latter being drawn forward in said intermittent movement between each fastening operation.

3,922,810
FISHING GEAR RETRIEVER
Ellsworth A. Kelly, 614 Baker St., Longmont, Colo. 80501
Filed Jan. 16, 1975, Ser. No. 541,509
Int. Cl.² A01K *97/00*
U.S. Cl. 43—17.2 **5 Claims**

1. A fishing gear retriever adapted to move down a fishing line to which said fishing gear is connected, comprising:

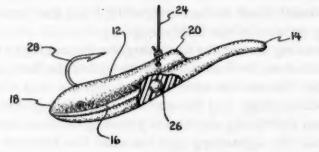
generally coaxial, spaced, generally circular members;

a slot in each member which permits a fishing line to be moved to a position inside said member, the lower of said members being cylindrical and provided with an inclined slot;

means connecting said members, including a first upright rod attached to each of said members and a second upright rod spaced from the upper circular member and spaced from said lower cylindrical member downwardly to a point below said slot; and

clamping means carried by one of said members for engaging said fishing gear.

3,922,811
FISHING LURE
Elmer M. Ellingson, Buford, N. Dak. 58837
Filed Apr. 19, 1974, Ser. No. 462,377
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.39 **5 Claims**



1. A fishing lure having a heavier-than-water body including an upstanding dorsal fin, two side fins protruding outwardly from either side of the body, and a tail fin extending laterally outwardly from the body and rearwardly thereof;

means on an upper rearward portion of the dorsal fin to receive and retain a fishing line;

a fish hook permanently mounted in the body; and

said lure having a center of gravity in the bottom half of the body and slightly forward of the point of connection of the fishing line to the dorsal fin.

2. A fishing lure having a heavier-than-water body including an upstanding dorsal fin, two side fins protruding outwardly from either side of the body, and a tail fin extending rearwardly thereof;

means on an upper rearward portion of the dorsal fin to receive and retain a fishing line;

a balancing weight of substantially higher specific gravity than that of the lure body, said weight being embedded in a bottom portion of the body adjacent to the point of connection of the fishing line to the dorsal fin, but on the side of the fishing line toward the head of the lure; and

a fish hook permanently mounted in the body.

3,922,812
PORPOISE STRANDING DEVICE
Joseph W. Steele, Kailua, Hawaii, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 3, 1975, Ser. No. 546,370
Int. Cl.² A01K *69/00*
U.S. Cl. 43—100 **6 Claims**

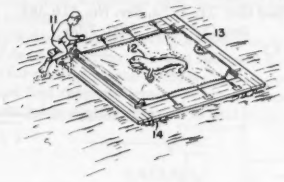
1. A catching and stranding tool in combination with an open ended animal husbandry confine comprising:

flexible canvas sheet means attached at one edge to one side of the open end of said animal husbandry confine of a width to extend substantially thereacross and being of an extent to have a slack portion flexibly conforming to the inner circumferential extent of said animal husbandry confine with an opposite edge emerging adjacent the opposite side of the open end of said animal husbandry confine for providing noninjurous engagement with an animal confined therein;

reinforcement strips attached to said canvas sheet and extending thereacross;

attachment means connected to the ends of said reinforcement for supportive connection thereto;

reel means connected to said opposiste edge of said flexible sheet means for spoolably winding said sheet means thereon; and



winding means attached at the opposite side of the open end of said animal husbandry confine and constructed to rotatably engage said reel means for selectively spooling and unspooling the slack portion of said flexible sheet means to stretch said flexible sheet means tautly across the open end and to permit it to conform to the inner circumferential extent of said animal husbandry confine.

3,922,813

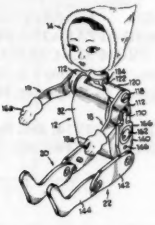
DOLL WITH MOTORIZED LEGS DRIVEN IN UNISON AND ARMS DRIVEN IN UNISON THEREBY

Rouben T. Terzian, and Marvin I. Glass, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed June 22, 1972, Ser. No. 265,220

Int. Cl.[2] A63H *13/18*

U.S. Cl. 46—119 **7 Claims**



1. An articulated movable doll having normally forwardly facing directional features, comprising:

means defining a doll torso having an interior;

a pair of simulated legs pivotally connected to said torso for rotation about a first axis extending generally side-to-side of said torso generally transverse to said forward direction;

a pair of simulated arms pivotally connected to said torso for rotation about a second axis extending side-to-side generally through the shoulder areas of the doll;

means connecting said arms to said legs so as to be driven thereby together in unison in a front-to-rear to-and-fro articulated motion relative to said torso generally transverse to said second axis;

motorized continuously operably drive means in said torso interior including an output shaft connected to said legs for driving said legs in unison in a front-to-rear to-and-fro plural cyclical articulated motion relative to said torso generally transverse to said first axis in response to actuation of said drive means so as to provide a continuous rocking motion between the doll torso and the arms and legs of the doll; and

manually operable actuating means to initiate operation of said motorized drive means to rockingly move said arms and legs relative to the torso continuously during operation of the motorized drive means.

3,922,814

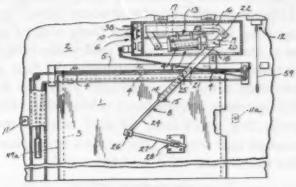
CONTROL SWITCHING FOR AUTOMATIC LOAD OPERATORS

Arthur J. Runft, Mequon, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Dec. 27, 1973, Ser. No. 428,923

Int. Cl.[2] E05F *15/20*

U.S. Cl. 49—28 **12 Claims**



1. In an automatic door operator for a door, a motor means, a mechanical linkage coupling being connected to the output of said motor means and transferring the driving force to said door wherein said linkage includes a force transmitting arm including an essentially rigid portion and a flexible resilient elongated portion having an unstressed extended position, said arm being pivotally mounted and said flexible elongated portion having minimal deflection from said unstressed extended position with respect to the rigid portion in response to normal movement of said door and said flexible portion having increasing deflection from said unstressed extended position in accordance with interferences with said movement of said door, and a force responsive safety switch means coupled to the motor means being secured to said linkage and to said rigid portion with an operating means spaced from said flexible portion and in the deflection path of said flexible portion and actuated by selected deflection of said arm in response to the establishment of an opposing force of a selected level to activate said motor means.

3,922,815

WINDTIGHT SEALING MEANS FOR A WINDOW OR THE LIKE HAVING A PAIR OF HORIZONTALLY MOVABLE PANEL ASSEMBLIES

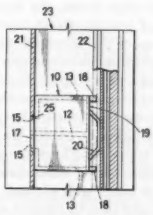
Shuichi Hosooka, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,824

Claims priority, application Japan, Dec. 28, 1973, 49-5002[U]

Int. Cl.[2] E06B *7/14*

U.S. Cl. 49—408 **3 Claims**



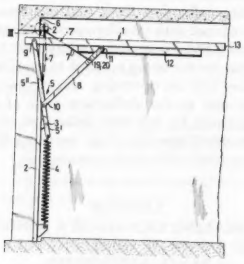
1. In a supporting frame of a window or the like, wherein said supporting frame includes a sill having front and rear rails

arranged in parallel spaced relationship thereon, said front rail having a first groove extending longitudinally along its bottom edge and an aperture formed in a prescribed position of said groove therethrough, said rear rail having a second groove extending longitudinally along its bottom edge, said first and second grooves being open toward each other, windtight sealing means comprising, in combination, an openbottom boxlike member adapted to be mounted between said front and rear rails, said boxlike member having a pair of opposed side walls through which there are formed a pair of water inlet openings, respectively, and a front wall through which there are formed a pair of water outlet openings in side-by-side arrangement, a transverse partition within said boxlike member dividing the interior thereof into a pair of opposed chambers, each of said chambers being open through one of said water inlet openings and one of said water outlet openings, rim means projecting forwardly of said front wall of said boxlike member to at least partly surround said water outlet openings, said rim means being slidable through said first groove and being capable of projecting into said aperture to hold said water outlet openings in registered relationship thereto, a pair of ears projecting rearwardly of said boxlike member and slidable through said second groove, and spring means biasing said boxlike member toward said front rail.

3,922,816
SWINGABLE GARAGE DOOR

Hermann Hormann, Steinhagen, Germany, assignor to Hormann KG, Germany

Filed Jan. 10, 1974, Ser. No. 432,427
Claims priority, application Germany, Jan. 12, 1973, 2301539
Int. Cl.² E05D *15/40*
U.S. Cl. 49—205 **3 Claims**

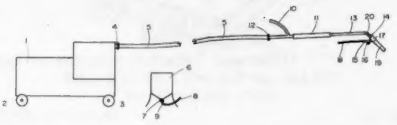


1. In a swingable door for garages in which the door panel is held for swinging movement by two-armed levers with respectively one short and one long lever arm and the levers being spring biased, a supporting lever for each two-armed lever and having one end articulated to the associated two-armed lever between a first bearing point of the two-armed lever at the edge frame for the door and an associated second bearing point at the door panel at a point proximate to the first bearing point at the edge frame, the supporting lever having the other end thereof provided with runner means for guided movement with respect to the door panel, and a holding means for each supporting lever connected between an upper end of the edge frame or an inner wall surface and the supporting lever, the improvement comprising the holding means including flexible spring band means having the broad surface portions thereof extending in planes transverse to the planes of movement of the supporting levers, means rigidly mounting one end of said flexible spring band means on said upper end of the edge frame or inner wall surface, and means pivotally mounting the other end of said flexible spring band means on the supporting levers, said flexible spring band means being angularly disposed with respect to the edge frame or inner wall surface so that it is tensioned when the door is closed and untensioned when the door is open, whereby said flexible spring band means constantly exerts a force on said supporting levers during said swinging movement to prevent wobbling of said running means.

3,922,817
COMBINED STEAM AND ABRASIVE MATERIAL CLEANING DEVICE

Otto Wemmer, Columbia, S.C.

Filed Oct. 21, 1974, Ser. No. 516,385
Int. Cl.² B24C *7/00, 3/06*
U.S. Cl. 51—12 **17 Claims**



1. A cleaning device for removing various substances from various surfaces comprising:

a. a mobile steam cleaner comprising a water system, a heating system, and a discharge system including an outlet steam hose;

b. a nozzle to which said outlet steam hose is connected;

c. a source of abrasive material including an abrasive material supply hose which is also connected to said nozzle;

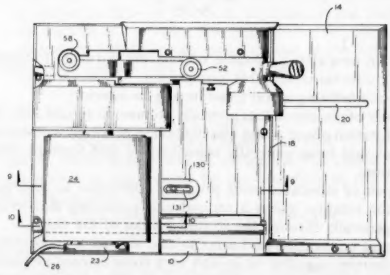
d. a manually-adjustable air supply valve operative to vary the flow of said abrasive material through said abrasive material supply hose;

whereby steam is passed through said nozzle, under high pressure, by said steam cleaner, drawing said abrasive material into said nozzle, wherefrom a combination of said steam and said abrasive material is blasted onto said various surfaces to remove said various substances.

3,922,818
METHOD AND APPARATUS FOR STRIPPING INSULATION FROM ELECTRICAL CONDUCTORS

Louis M. Carpenter, and Kenneth L. Dunn, both of Fayetteville, N.Y., assignors to Carpenter Mfg. Co. Inc., Manlius, N.Y.

Filed July 22, 1974, Ser. No. 490,738
Int. Cl.² B24B *1/00, 19/00*
U.S. Cl. 51—40 **7 Claims**



1. Apparatus for stripping insulation from an elongated electrical cable comprising, in combination:

a. a first support member;

b. a fixed base upon which said first support member is mounted for reciprocal, linear movement;

c. a second support member pivotally attached to said first support member for movement relative thereto about a first horizontal axis;

d. a first arm formed integrally with and extending forwardly from the pivotal connection of said second to said first support member;

e. a second arm pivotally attached to said second support member for movement relative thereto about a second horizontal axis, parallel to said first axis, and extending generally parallel to said first arm;

f. a pair of stripper wheels respectively mounted at the forward ends of said arms for rotation about spaced, parallel, third horizontal axes, perpendicular to said first and second axes;

g. a workpiece support having a horizontally disposed surface fixed with respect to said base and having a cut-out area for passage of said stripping wheels upon movement of said first support member relative thereto; and

h. means for imparting rotation to said stripper wheels.

3,922,819

DEVICE FOR MACHINING MANTLE SURFACES

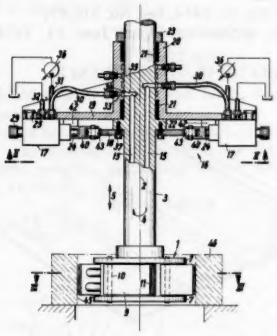
Albert Bender, Nellingen, and Hans Grimm, Berkheim, both of Germany, assignors to Maschinenfabrik Gehring KG, Nellingen, Germany

Continuation of Ser. No. 355,862, April 30, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,105

Claims priority, application Germany, Apr. 29, 1972, 2221207

Int. Cl.² B24B *7/04, 17/00*

U.S. Cl. 51—101 R **7 Claims**



1. An apparatus for machining an internal peripheral surface of varying radius comprising in combination a rotatable tool body, at least one machining element mounted on said tool body for movement radially outwardly, a pressure fluid device on said tool body engaging said machining element for moving said element outwardly into contact with said internal surface, a source of pressure fluid means connected to said pressure fluid device to press said machining element outwardly, a pressure regulating device controlling the pressure to said pressure fluid device, both said source of pressure fluid means and said pressure regulating device being connected positively to said pressure fluid device, a transmission drive operating said pressure regulating device to control the pressure exerted on the machining element, and a program device engaging said transmission drive to compensate and adjust said pressure regulating device according to rotational angle position, said transmission drive and program device being mounted for relative rotary movement in synchronism with the rotation of said tool body.

3,922,820

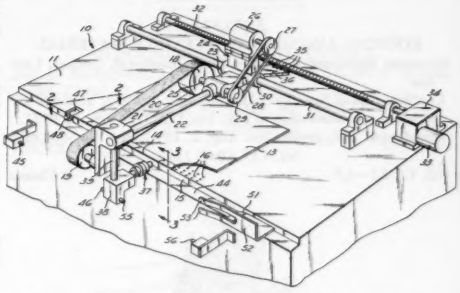
MEANS FOR FEATHERING RUBBER STOCK

Arthur J. Wiltshire, Richmond Heights, Ohio, assignor to Structural Fibers, Inc., Chardon, Ohio

Filed Jan. 9, 1974, Ser. No. 431,919

Int. Cl.² B24B *21/04*

U.S. Cl. 51—142 **4 Claims**



1. Apparatus for skiving edge portions of sheet stock, comprising a flat table having a surface adapted to support sheet stock, said table having means to retain an edge of said stock in coplanar relationship with an edge of said table, an endless abrasive belt mounted between a drive roller and an idler roller and having a flat reach extending at an acute angle with respect to the plane of said table, at least a portion of said flat reach overlying and being intersected by a plane normal to said table and passing through said table edge, one of said rollers having at least a portion thereof located below the plane of said table, said roller adjacent said portion of said flat reach being supported relative to the table by a roller which is adapted to roll along a shelf portion of said table adjacent said edge.

3,922,821

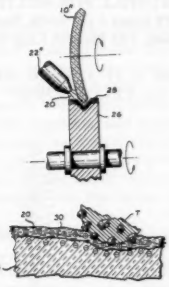
GRINDING METHOD AND COOLANT THEREFOR

Bradford Canterbury, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 397,480, Sept. 14, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,245

Int. Cl.² B24B *1/00*

U.S. Cl. 51—284 R **9 Claims**



1. The method of grinding a workpiece of vitreous material with a grinding tool comprising the steps of:

bringing the workpiece and tool into grinding relationship with each other;

producing relative movement between said workpiece and tool to introduce a grinding action upon said workpiece at points of contact between said tool and said workpiece along a surface thereof to be ground, said surface being anionically charged when ground; and

applying to said surface of said workpiece a coolant comprising the mixture of a large proportion of a free flowing liquid in which polyethylenimine is soluble and a relatively small proportion of polyethylenimine rendering the mixture cationic and lubricative; and workpiece and heating thereof is minimized with enhancement of the grinding action and its result.

3,922,822

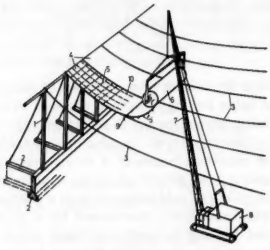
ROOFING ASSEMBLY OF FLEXIBLE MATERIAL

Sebastian Mollinger, 17 Irving Place, Montreal, Quebec, Canada

Continuation of Ser. No. 320,483, Jan. 2, 1973, abandoned, which is a continuation of Ser. No. 113,379, Feb. 8, 1971, abandoned. This application Aug. 2, 1974, Ser. No. 494,684

Int. Cl.[2] E04B *1/12*

U.S. Cl. 52—63 **8 Claims**



1. A roofing assembly comprising a substantially rectangular roof membrane made of one or more layers of flexible material, said membrane being superimposed on spaced apart load transfer members having a flat support surface connected to said membrane, said load transfer members being superimposed on and connected to a respective flexible load carrying tension member, said tension members being connected at their ends to a respective roof supporting main cable, said load transfer members and tension members extending transversely to the longitudinal axis of said membrane and between adjacent main cables.

3,922,823

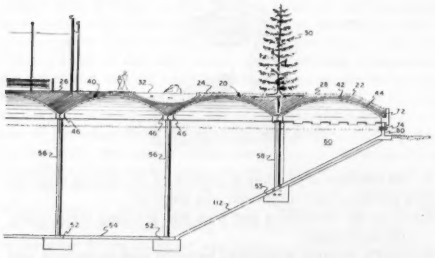
ENCLOSED CONCRETE WATER RESERVOIR SUPPORTING EARTHFILL FOR MULTIPLE LAND USES

Jimmie D. King, 8316 Stone Ave. North, Seattle, Wash. 98103, and Harry R. Powell, 102 Maiden Lane East, Seattle, Wash. 98112

Filed Nov. 1, 1973, Ser. No. 411,744

Int. Cl.[2] E02D *29/00*

U.S. Cl. 52—80 **12 Claims**



1. An enclosed concrete water reservoir, utilizing a comparative minimum amount of materials, designed to be substantially completely surrounded by earth, the earth above being of sufficient depth for the creation of scenic and recreational park facilities, inclusive of soil supporting tree growth, comprising:

a. a continuous floor inclusive of footings;

b. surrounding side walls;

c. spaced columns positioned over the footings;

d. post-tensioned valley beams integrally made in molules with integral domes and supported on the spaced columns;

e. horizontal cable tendons used in the post-tensioning of the overall arrangement of the integral valley beam and dome molules; and

f. selectively spaced interior shear walls arranged perpendicular to the surrounding side walls having components of shear key structures along their tops, and wherein the post-tensioned valley beams integrally made in modules with the integral domes, where such valley beams are located over the interior shear walls, have components of shear key structures along their bottoms which complementary, with slight spacing, otherwise interfit with the shear key structures of the interior shear walls;

g. compressible sealing materials installed between adjacent concrete components of the reservoir to accommodate expansion and contraction of the enclosed concrete reservoir during both temperature changes and surrounding earth movements, to thereby seal and keep sealed the interfaces between adjacent concrete components.

3,922,824

WATER-TIGHT ROOF VERGE EDGE TRIMMING

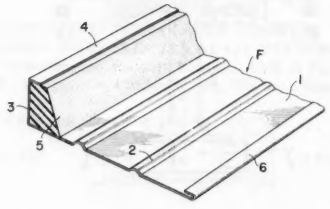
Hisao Izawa, Hoya, and Hiroshi Takemori, Musashino, both of Japan, assignors to Sanko Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1974, Ser. No. 519,977

Claims priority, application Japan, June 11, 1974, 49-67722[U]

Int. Cl.[2] E04B *7/00;* **E04D** *13/15*

U.S. Cl. 52—94 **1 Claim**



1. A watertight trimming structure for a sloping verge edge of a sloping roof supported at a part thereof near said verge edge above a correspondingly sloping top of a vertical gable wall, said trimming structure comprising a flashing of integral construction having the following combination of features:

a. an elongated main planar part secured to the sloping top of said wall along the entire length thereof and below said part of the roof, and having spaced apart ridges extending longitudinally of said planar part for arresting transverse flow of water;

b. said planar part at one longitudinal side thereof extends beyond the outer surface of said wall to form an overhang extension serving as eaves and having a bent-back portion formed along the other longitudinal side thereof for arresting water which might enter between the roof and the flashing;

c. an upstanding wall formed along the outer longitudinal side, with respect to said wall, of said planar part and having a top flange bent inwardly with respect to said wall substantially in parallel with said planar part, said planar part, upstanding wall, and top flange defining a space extending longitudinally of the flashing and opening inwardly; and

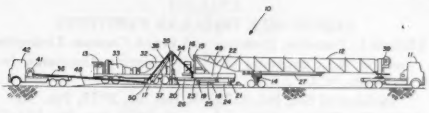
d. an elongated elastic sealing member fitted in said space to sealingly engage the verge edge of said roof.

3,922,825

SYSTEM FOR ERECTING AN OIL WELL DERRICK

Kenneth Harmon Eddy, and Kenneth Harmon McGill, both of Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 353,033, April 20, 1973, abandoned.
This application Dec. 30, 1974, Ser. No. 537,226
Int. Cl.[2] E04H *12/34*; B66C *23/60*
U.S. Cl. 52—116 4 Claims



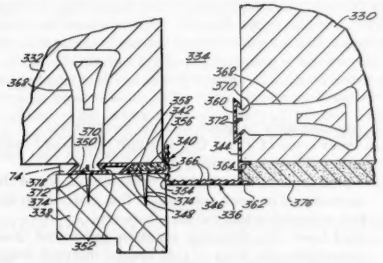
1. A method of erecting an oil well derrick from a reclining position to an upright position, comprising the steps of:
positioning a stationary base at a well site,
connecting a movable base to said stationary base by means that will allow the movable base to be elevated relative to said stationary base,
connecting a reclining derrick mast to the movable base by a rotatable connection,
elevating said movable base relative said stationary base, and
rotating said mast on the rotatable connection until the mast is in its erect position.

3,922,826

BUILDING CONSTRUCTION

George Molyneux, 1, Halstead Lane, Barrowford, Nelson, County of Lancaster, England

Division of Ser. No. 120,990, March 4, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,634
Claims priority, application United Kingdom, Mar. 24, 1970, 14151/70
Int. Cl.[2] E06B *1/26*
U.S. Cl. 52—204 13 Claims



1. A structural assembly comprising a pair of walls, each wall having inner and outer leaves, each of said leaves being built-up from a plurality of building blocks bonded together by cementitious material, and said leaves being laterally spaced from each other to provide a cavity therebetween; a frame having sides and being positioned with its sides in close juxtaposition to ends of said walls, and damp proof course elements positioned at least between said frame sides and said ends of said walls, each of said damp proof course elements comprising an integral strip of plastics material along its frame side with corrosion-resistant, liquid-impermeable properties, each strip being of constant cross-section throughout its length, each strip having a first longitudinal part and a second longitudinal part, said first part of said each strip engaging between its frame side and at least one of said leaves of its wall end, said second part of said each strip bridging the end of said cavity between said leaves of its wall end, said each strip further having a cavity entering part comprising a pair of laterally spaced walls extending into said cavity, and keying means securing said elements to said walls.

3,922,827

HYPERBOLIC TOWER STRUCTURE

Joel H. Rosenblatt, 12607 Meadowood Drive, Silver Spring, Md. 20904

Filed June 1, 1973, Ser. No. 366,117
Int. Cl. E04h *5/12*
U.S. Cl. 52—245 15 Claims

1. A tower structure comprising:
a. the base;
b. two sets of oppositely inclined intersecting circularly arranged linear structural elements on said base extending upwardly therefrom to define a vertical hyperboloid of revolution of one sheet;
c. central vertical shaft means within said hyperboloid of revolution;
d. brace means interconnecting said linear elements to resist buckling thereof including radial horizontal tie rod members connecting intersections of said linear members to said central vertical shaft means;
e. said linear structural elements being defined by successively connected segments, said segments having aligned bar elements projecting from the intermediate portions of said segments on opposite sides thereof oriented to interlock with adjacent oppositely inclined segments and defining intersections on the linear structural elements therebetween;
f. means fastening said bar elements to said adjacent segments; and
g. means connecting said radial horizontal tie rod members to said intersections.

3,922,828

STRUCTURAL MEMBER

David B. Patton, Orange, Calif., assignor to Tri-International Corporation, Orange, Calif.

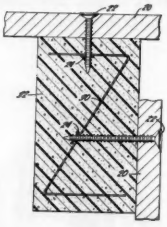
Filed Nov. 15, 1973, Ser. No. 416,046
Int. Cl.[2] E04C *3/29*
U.S. Cl. 52—368 2 Claims

1. A structural element for incorporation into structures

such as private and public buildings and for retaining wall components and the like which comprises:

an elongate molded body having at least two generally flat surfaces disposed in parallel planes and formed of an expanded synthetic polymer composition; and

a sheet metal member encased in the molded body generally coextensive with the molded body longitudinally thereof and said sheet metal body having a Z-shaped cross-sectional configuration and being formed of a metal having sufficient stiffness to provide self maintenance of the Z-shaped cross-section yet having a penetrability to accommodate the driving of nails therethrough and so disposed in said molded body as to have the portions representing



the arms of the Z-shape occupying planes generally parallel to and spaced inwardly from the aforementioned flat faces of the molded body and the intermediate portion of the Z-shape extending obliquely of the arms between opposite ends of the said arms of the Z-shape to accommodate penetration of the embedded sheet metal member by nails of appropriate length driven into the molded body from either of the aforementioned flat faces and also nails driven into the molded body between and generally parallel to arms of said Z-shape with resultant deformity of the sheet metal into the portion of the molded body that is backing the sheet metal on the side opposite the side of penetrative entry of the nail.

3,922,829

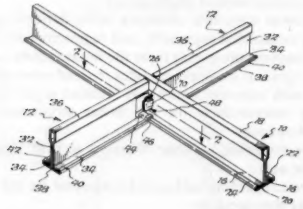
LOCKING CONNECTION FOR SUPPORTING GRID SYSTEMS

Gale E. Sauer, Williamsville, N.Y., assignor to Roblin Hope's Industries, Inc., Buffalo, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,432

Int. Cl.[2] F16B *7/22*

U.S. Cl. 52—667 **10 Claims**



1. A locking connection for supporting grid systems and the like comprising a first support member having a flange and a web upstanding therefrom; said web being provided with a slot; a second support member having a flange and web upstanding therefrom; said second member web being provided with a locking connector extending axially therefrom and insertable through said slot; said locking connector having a first portion engaging one side of said first support member web and a resiliently yieldable second portion having a terminal edge inclined at an angle relative to the plane of said first support member web in the fully assembled relation therewith; said terminal edge having at least a portion thereof engaging against the side of said first support member web opposite said first locking connector portion whereby said first portion and said edge portion simultaneously engage the opposite sides of said first support member web in the fully assembled relation therewith.

3,922,830

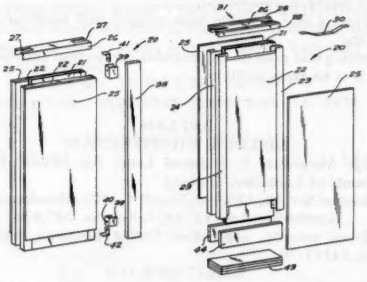
ADJUSTABLE MODULAR PARTITION

Michael C. Guarino, Rumson, and Frank Cacossa, Livingston, both of N.J., assignors to M. C. Guarino Associates, Inc., Belleville, N.J.

Division of Ser. No. 327,609, Jan. 26, 1973, Pat. No. 3,866,370. This application Aug. 29, 1974, Ser. No. 501,472

Int. Cl.[2] E04C *2/32*

U.S. Cl. 52—623 **2 Claims**



2. An adjustable partition module comprising:

an inner layer of a first fire resistant and sound deadening material having opposing sides;

a second layer of a second fire resistant and sound deadening material on each side of said first material so that said first material is located therebetween;

a third layer of a third fire resistant and sound deadening material on the sides of said second material distal from said first material so that said first and second material are located therebetween;

means for fastening said three layers together to form a partition module with high sound deadening and fire resistive qualities;

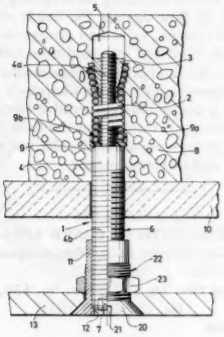
each of the opposed vertical sides of the partition module containing a vertical recess adapted to receive a portion of a vertical spline member therein; and

at least the surfaces forming the vertical recess being covered by a rigid supporting channel for stiffening predetermined portions of the module and which is adapted to be resiliently deformed sufficiently for accommodation of dimensional differences in spline members and to frictionally engage with an appropriate spline member so as to facilitate interengagement therewith.

3,922,831
EXPANSION ANCHOR FOR MOUNTING OBJECTS AT AN ADJUSTABLE DISTANCE FROM A SUPPORT STRUCTURE

Artur Fischer, Altheimer Str. 219 D-7241, Tumlingen, Germany

Filed Mar. 22, 1974, Ser. No. 453,835
Claims priority, application Germany, Apr. 16, 1973, 2319226; May 2, 1973, 2321967
Int. Cl.² E04B *1/38*
U.S. Cl. 52—704 **1 Claim**



1. An expansion anchor for mounting objects at an adjustable distance from a support structure comprising an expansion anchor sleeve adapted for insertion into an expansion anchor hole and having a leading end and a trailing end; an expansion member at said leading end and adapted to be drawn into said sleeve for expanding the same; an externally threaded rod-shapped member having a front portion extending through said sleeve from said trailing to leading end thereof and adapted to draw said expanded member into said leading end when turned in requisite direction, and a rear portion projecting outwardly beyond said trailing end and said expansion anchor hole; a tapped sleeve threaded onto said rear portion and having an end which faces away from said expansion anchor sleeve and is formed with a head; and an abutment on said tapped sleeve and adapted to clamp between itself and said head an object through which said rear portion extends so that said abutment and head are located at opposite sides of the object and further comprising a tubular cap of synthetic plastic material at said trailing end of said sleeve and including an inner tubular collar extending into said sleeve, an outer tubular collar exteriorly surrounding said sleeve, and an annular portion connecting said collars and overlaying an axial end face of said trailing end.

3,922,832
CONSTRUCTION METHOD OF ASSEMBLING BAGGED, SETTABLE MODULES

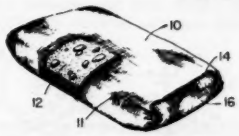
Edward T. Dicker, 2600 Fairmont St., Dallas, Tex. 75201

Continuation of Ser. No. 162,490, July 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 767,071, Aug. 26, 1968, abandoned, which is a continuation-in-part of Ser. No. 736,538, April 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 668,575, Sept. 18, 1967, abandoned. This application July 23, 1973, Ser. No. 381,727
Int. Cl.² E04B *1/04, 1/48, 2/06*
U.S. Cl. 52—742 **22 Claims**

9. A method of constructing a monolithic wall suitable for housing structures using discrete construction units comprising a dry mixture contained within porous containers which, when wetted, are activated to set up as hardened structural members, comprising the steps of:

a. arranging said construction units in superimposed courses;

b. wetting each of said units to activate said mixture to set up and form an integrated structure; and

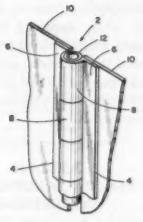


c. applying a skin of finishing material onto the side of the superimposed courses under substantial pressure so that said finishing material is bonded directly to said mixture through the pores in said containers and said skin and said superimposed courses form an integral monolithic structure.

3,922,833
FASTENER

Robert F. Eaton, Riverside, Ill., assignor to Service Master Industries Inc., Downers Grove, Ill.

Filed Aug. 5, 1974, Ser. No. 494,621
Int. Cl.² F16B *5/07, 2/20*
U.S. Cl. 52—753 C **4 Claims**



1. A fastener for hingedly and detachably securing a panel to a rod-shaped structure having a substantially round cross-sectional periphery comprising:

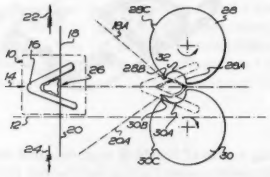
a strip section secured to said panel; and

a series of flexible, resilient fastening sections having a partially circular cross-section shape, said fastening sections being spaced along said strip member, said circularity extending more than **180°**, said partially circular section defining a first arc-ending longitudinal edge unitarily joining said section, a second free longitudinal edge, and a substantially round inner periphery substantially corresponding to said cross-sectional periphery of said rod-shaped structure, said fastening sections being adapted to engagingly receive said rod-shaped structure, said fastening sections, strip section, and rod-shaped structure cooperating to define hinge means for rotating said panel, said first and second longitudinal edges defining a transverse gap therebetween, said shape and flexibility of said fastening sections cooperating to define means for flexing said free longitudinal edge away from said strip section to increase the distance across said transverse gap, whereby said fastener is secured to and detached from said rod-shaped structure by urging said longitudinal edges in opposite directions against said rod-shaped structure.

3,922,834
APPARATUS FOR CLOSING OF WRAPPING BAGS OR SLEEVES

John Michael Clayton, Menston, Nr. Ilkey, England, assignor to Norpak Machines Limited, England

Filed Apr. 3, 1974, Ser. No. 457,552
Int. Cl.² B65B *61/00*
U.S. Cl. 53—138 A 7 Claims



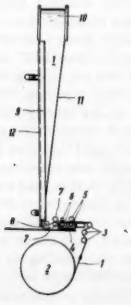
6. Apparatus for applying ties to the gathered ends of wrapping bags and sleeves comprising

1. means for supporting two supplies of strip material which can be joined by heating,
2. wrapping and strip joining means adapted to receive the joined ends of the two strips of material, wrap the strips around the gathered end of the wrapping bag or sleeve adjacent said joined ends, and join the strips at the other side of the gathered end, said wrapping and strip joining means including a pair of rollers between which the strips and gathered end are received, the rollers each having a peripheral cut-out which come together to form a cavity in which the gathered end locates as it passes between the rollers, each of the rollers having a pair of spaced apart heat sealing bars for joining the two strips by cooperating with the corresponding bars on the other roll to press the strips together while applying heat thereto, whereby as the rollers rotate a first pair of sealing bars joins the strips wrapped around the gathered end and then a second pair of sealing bars again joins the strips and causes the tie to be severed from the strips while leaving the strips joined together at their ends.

3,922,835
APPARATUS FOR PACKAGING UNDER STERILE CONDITIONS

Wilhelm Reil, Bensheim-Auerbach, Germany, assignor to Altstadter Verpackungs Vertriebs GmbH, Pfungstadt, Germany

Filed Oct. 11, 1973, Ser. No. 405,512
Int. Cl.² B65B *55/10*
U.S. Cl. 53—167 6 Claims

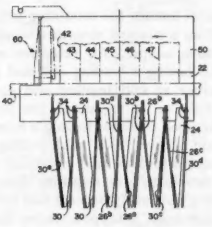


1. In a fluid container filling apparatus having a fluid supply system, a tube formed from a ribbon, the tube being filled with a fluid and then intermittently compressed to form discrete filled containers, the apparatus having means for filling sterile liquids into the tube and comprising a constant pressure fluid storage means, conduit means to feed fluid during the filling procedure from said storage means into said tube, feed pipe means between the fluid supply and said constant pressure fluid storage means, valve means between said feed pipe supply and storage means, the valve being responsive to the level of fluid in said storage means to control the feeding of fluid to said constant pressure fluid storage means, constantly open air flow sterilizing means for continuously supplying a stream of hot, sterile air under a pressure above atmospheric pressure, said steriiizing means including air directing means to direct said air stream to flow against the inside of said tube and throughout said conduit, valve and storage means before said storage means is filled and into said tube and the fluid filled therein and over the fluid in the storage means during the tube filling and compressing procedure whereby a pre-sterilization procedure and a continuously operative sterile filling condition can be maintained throughcut the fluid flow passages of the filling and storage apparatus by the use solely of the air flow sterilizing and directing means.

3,922,836
GRID FOR ARTICLE CASER APPARATUS

Robert W. McGill, Munroe Falls, Ohio, assignor to A-T-O Inc., Willoughby, Ohio

Filed Dec. 26, 1974, Ser. No. 536,426
Int. Cl.² B65B *39/02*
U.S. Cl. 53—248 7 Claims



1. In a grid for an article caser supplying rows of abutted articles for deposit into a case, the grid including longitudinally extending partition means, retractible longitudinally extending article slide support members, and spring drop fingers defining individual drop areas for individual articles, a plurality of individual drop areas being formed in longitudinally aligned relation between each adjacent pair of said partition means, and characterized by a pair of drop fingers for each drop area extending perpendicularly to said partition means, said drop fingers of said pairs being operatively positioned on said partition members with the upper ends of such drop fingers at progressively lower levels in at least one direction from one part of the grid except for the drop fingers at at least one end of the grid.

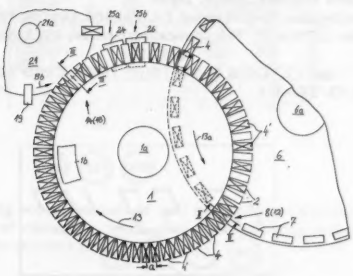
3,922,837
PACKING MACHINE FOR CIGARETTES OR THE LIKE

Harry David, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Mar. 13, 1974, Ser. No. 450,618
Claims priority, application Germany, Mar. 28, 1973, 2315338
Int. Cl.² B65B *11/32*
U.S. Cl. 53—234 10 Claims

1. In a machine for manipulating cigarettes, cigarette packs and/or analogous commodities forming part of or constituting smokers' products, particularly in a packing machine, a combination comprising conveyor means having an annulus of

equally spaced receiving means for commodities, the neighboring receiving means of said annulus being spaced apart from each other by a predetermined distance; drive means for moving said conveyor means stepwise in a predetermined direction through second distances each of which is a whole multiple of said first distance whereby the receiving means travel along an endless path past spaced-apart first and second transfer stations; means for feeding commodities to receiving means at said first transfer station during intervals between successive movements of said conveyor means; and means for accepting commodities from receiving means at said second transfer station during intervals between successive move-



ments of said conveyor means, the distance between said second and first stations, as considered in said direction, being equal to at least one full second distance and the distance between said first and second stations, as considered in said direction, being equal to *m* first distances wherein *m* is a whole number including one and unequal to *n* second distances wherein *n* is a whole number including one, whereby each commodity which is fed to a receiving means at said first transfer station bypasses said second and first stations at least once prior to coming to a halt at said second transfer station and each receiving means which is relieved of a commodity at said second transfer station thereupon comes to a halt at said first transfer station to receive a fresh commodity.

3,922,838

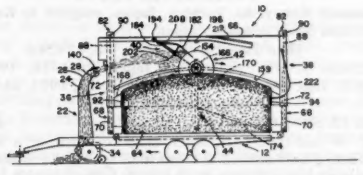
MACHINE FOR FORMING A COMPACT STACK OF CROP MATERIAL

Charles M. Kline, Reinholds; Edward H. Priepke, Stevens; Thomas W. Waldrop, New Holland; Raymond E. Fisher, Lancaster; James G. Greiner, Leola, and Horace G. McCarty, Lancaster, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 5, 1974, Ser. No. 458,266

Int. Cl.[2] A01D *87/10*

U.S. Cl. 56—344 **20 Claims**



1. In a machine for forming a stack of crop material such as hay or the like, the combination comprising:

a mobile stack forming chamber adapted to move across a field;

means coupled with said chamber for continuously delivering crop material from the field into said chamber through a first end of said chamber to adjacent an opposite second end of said chamber; and

a baffle member mounted to said chamber for movement back and forth between said ends of said chamber so as to at least partially obstruct said delivery of crop material to adjacent said opposite second end of said chamber from time to time and distribute said crop material within said chamber between said ends thereof and thereby progressively form a stack of said crop material in said chamber.

3,922,839

DEVICE FOR PREVENTING ACCUMULATION OF FIBERS IN A SPINNING MACHINE

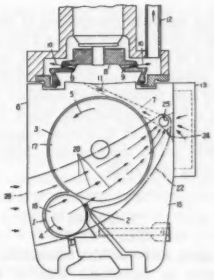
Waichi Sakurai, and Sadanobu Yoshie, both of Fukui, Japan, assignors to Daiwa Boseki Kabushiki Kaisha, Osaka and Kabushiki Kaisha Toyota Jidoshokki Seisakusho, Kariya, both of, Japan

Filed May 20, 1974, Ser. No. 471,776

Claims priority, application Japan, May 25, 1973, 48-59029

Int. Cl.[2] D01H *1/12, 11/00*

U.S. Cl. 57—58.95 **10 Claims**



1. In a fiber spinning machine of the type including a body having rotatably mounted therein a fiber feed roller and a combing roller; said feed roller and combing roller having free lateral surfaces; a closure plate attached to said body and having an inner surface forming a space with said free lateral surfaces of said feed roller and combing roller; a rotary spinning chamber; a duct connected to said spinning chamber for exhausting air therefrom; and a channel extending through said body to a doffing area adjacent the periphery of said combing roller and to said spinning chamber for feeding fibers doffed from said combing roller at said doffing area to said spinning chamber; the improvement comprising:

means for preventing accumulation of fibers in said space between said free lateral surfaces of said feed roller and combing roller and said inner surfaces of said closure plate; said means comprising a groove formed in said inner surface of said closure plate, said groove extending in opposition to at least portions of said free lateral surfaces of said feed roller and combing roller, said groove having a first end communicating with said channel at a position thereof upstream from said doffing area, and said groove having a second end communicating with ambient atmosphere, whereby upon operation of said machine an air current is formed in said groove from said second end thereof to said first end thereof.

3,922,840
ROTOR SPINDLE DRIVING PART IN A SPINNING MACHINE

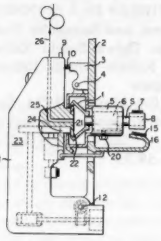
Etsuji Watanabe; Tsutomu Miyazaki, both of Kariya; Takashi Kato, Toyota, and Noriaki Miyamoto, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan, part interest to each

Filed Oct. 23, 1974, Ser. No. 517,435

Claims priority, application Japan, Oct. 31, 1973, 48-126022[U]

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.89 **5 Claims**



1. In a spinning machine comprising at least one spinning unit each having a rotor, which defines a spinning chamber, a spindle connected at one end to said rotor, bearing means for supporting said spindle for rotation, a member connected to the other end of said spindle, said member being made of a material having a heat conductivity lower than that of said spindle, a belt travelling in frictional engagement with said member to thereby rotate the spinning chamber of said rotor to perform spinning operation.

3,922,841
STEEL CORD

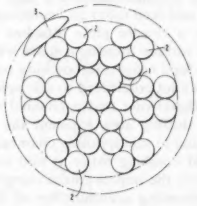
Tomoaki Katsumata, and Norihisa Matsushima, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed July 17, 1974, Ser. No. 489,325

Claims priority, application Japan, July 17, 1973, 48-81957

Int. Cl.² D07B *1/06*

U.S. Cl. 57—145 **3 Claims**



1. In a reinforcing steel cord including a core strand consisting of a plurality of wire filaments, a plurality of outer strands cabled together around said core strand, each outer strand consisting of a plurality of wire filaments, the improvement wherein; said core strand comprises a core filament and an outer layer of filaments, the lay direction of the outer layer of the core strand filaments and the lay direction of the outer strand filaments are opposite to each other, the lay direction of the cabling of the said outer strands is the same as that of the outer layer of said core strand filaments, the number of said filaments constituting said outer layer of said core strand is the same as the number of said outer strands, and the lay length of the core strand, the lay length of the outer strands and the cabling of the outer strands are so selected that the filaments in the outer layer of the core strand and the corresponding filaments in the outer strands contact each other linearly over their whole length.

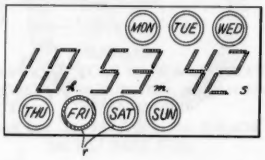
3,922,842
DISPLAY MEANS FOR SOLID STATE ELECTRONIC TIMEPIECE

Kinji Fujita, Nagano, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 193,404, Oct. 28, 1971, Pat. No. 3,796,037. This application Dec. 26, 1973, Ser. No. 428,283

Int. Cl.² G04B *19/24, 19/30, 19/06;* G09D *3/00*

U.S. Cl. 58—4 A **2 Claims**



1. In a solid state electronic timepiece having a time keeping mechanism and a time display mechanism responsive to said time keeping mechanism, the improvement which comprises a plurality of separate, normally visible indicia other than numerical characters on said timepiece, said indicia being representative of days of the week, and means in the region of each indicia but not including said indicia for selectively visually identifying a selected one or more of said indicia in response to said time keeping mechanism of said timepiece, said visual identifying means including a plurality of liquid crystal display segment means each in the form of a predetermined pattern and adapted to be rendered visible when energized, one of said display segment means being associated with and positioned in the region of each of said indicia, each of said display segment means being positioned so as to neither overlie nor be overlied by the associated indicia, each of the display segment means being in the form of a ring surrounding the associated day of the week indicia, said time keeping mechanism including circuit means for producing an output signal for the sequential energization of each of said display segment means during the day of the week of the associated indicia.

3,922,843
CYCLOMETER CLOCK

Masanori Kobayashi, Yachiyo, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Japan

Filed June 14, 1974, Ser. No. 479,566

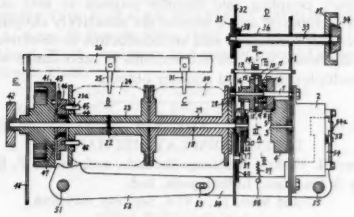
Claims priority, application Japan, June 16, 1973, 48-68871; June 16, 1973, 48-68872; June 16, 1973, 48-68873

Int. Cl.² G04C *21/18*

U.S. Cl. 58—16 D **4 Claims**

1. A leaf-type cyclometer clock comprising a seconds-indicating unit rotated at a constant speed, a constant speed motor rotatably driving said seconds-indicating unit, an intermittent motion-transmitting and speed-reducing unit driven by said seconds-indicating unit, a minutes-indicating unit intermittently driven by said intermittent motion-transmitting and speed-reducing unit at the rate of 6° each minute, an hour-indicating unit intermittently driven stepwise by said intermittent motion-transmitting and speed-reducing unit upon lapse of a predetermined number of minutes, means to

correct the time indications of said seconds-indicating unit and said hour-indicating unit independently of each other, an alarm unit actuated by said hour-indicating unit, and the alarm



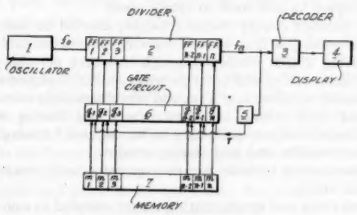
time being set in intervals of said lapse of a predetermined number of minutes in which said hour-indicating unit performs one stepwise rotation.

3,922,844

ELECTRONIC TIMEPIECE

Motoyoshi Sakamoto, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 25, 1974, Ser. No. 464,082
Claims priority, application Japan, Apr. 25, 1973, 48-47041
Int. Cl.² G04C *3/00*; G04B *27/08*
U.S. Cl. 58—23 R **10 Claims**



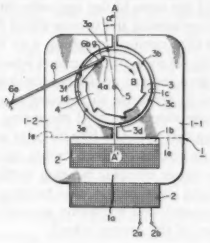
1. In an electronic timepiece including an oscillator circuit producing a high frequency time standard signal, divider means including a plurality of series-connected divider stage counters for receiving said high frequency time standard signal and dividing same to produce a low frequency timekeeping signal of a frequency having a period which is different than the actual time sought to be counted thereby, the improvement comprising timekeeping signal adjusting means coupled by output means to each divider stage counter, said adjusting means including memory means, said adjusting means being responsive to said timekeeping signal for supplying setting signals to predetermined divider stage counters through said output means selected by said memory means at the beginning of each period of said timekeeping signal to reset the count of each of said divider stage counters having setting signals applied thereto to adjust the period of said timekeeping signal to the actual time sought to be counted.

3,922,845

WATCH DRIVE PULSE MOTOR

Kenzi Miyasaka, Tokyo; Mikio Takemoto, Sayama; Yoshiaki Kato, Higashimurayama; Hiroyuki Uematu, Narashino; Munetaka Tamaru, Tokyo; Kazunari Kume, Tokorozawa; Hideshi Ohno, Sayama, and Mitsuo Onda, Fuchu, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 14, 1974, Ser. No. 469,904
Claims priority, application Japan, May 15, 1973, 48-56827
Int. Cl.² G04C *3/00*; H02K *7/06*
U.S. Cl. 58—23 D **8 Claims**



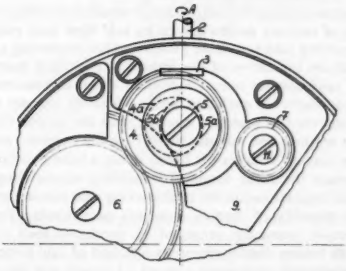
1. In a pulse drive electric motor for use in a small timepiece, especially watch, comprising a pulse generator adapted for supply of a series of periodically and alternatively polarity-reversing pulse series, a stator, a drive coil wound thereon and electrically connected with said pulse generator, a radially magnetized rotor rotatable relative to said stator, a ratchet wheel having a plurality of teeth, each having a leading surface and a trailing surface, said ratchet wheel being concentrically rigid with said rotor and an elongated reverse stop pawl cooperating with said ratchet wheel, the improvement comprising: wherein said pawl is positioned so as to positively and intentionally provide a special gap at the working tip end of said pawl and relative to the trailing surface of the nearest, tooth on said ratchet wheel when said drive coil is deenergized between said pulses in said series.

3,922,846

DATE SETTING DEVICE OF A CALENDAR WATCH

Jean-Pierre Gerber, La Chaux de Fonds, and Jean-Daniel Leimgruber, Le Locle, both of Switzerland, assignors to Zenith Time S.A., Switzerland

Filed Nov. 13, 1974, Ser. No. 523,520
Claims priority, application Switzerland, Dec. 7, 1973, 17182/73
Int. Cl.² G04B *19/24*
U.S. Cl. 58—58 **2 Claims**



1. A date-indicating watch comprising;

a rotatable winding and setting stem having at least two distinct axial positions including a pushed-in position and a pulled-out position;

a winding train;

a date ring; a date-setting wheel connected with the date ring to set the same;

a rotatable crown wheel operatively connected with the stem for rotation in a direction corresponding to the direction of rotation of the stem; and

means for operatively connecting the stem by the crown wheel, in said pushed-in position of the stem, to the winding train in response to rotation of the stem in said one direction and to the date-setting wheel in response to rotation of the stem in the opposite direction, comprising means for mounting the crown wheel for lateral displacement to a first position meshing with the winding train in response to rotation of the crown wheel in said one direction and to a second position meshing with the date-setting wheel in response to rotation of the crown wheel in the opposite direction, said mounting means including a hub having two opposite like circular segments defined by intersecting circles of given radius, and said crown wheel having an inner circular bearing surface whose radius is equal to said given radius, said bearing surface selectively bearing against said segments according to the direction of rotation of the crown wheel.

3,922,847

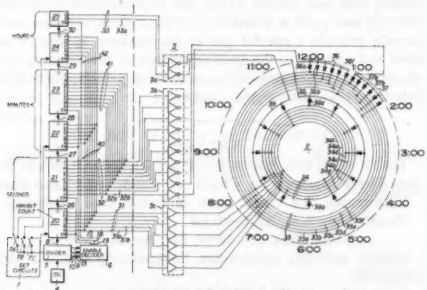
VLED SOLID STATE WATCH

Bobby Gene Culley, Plano, and Engelbert Wolfgang Kehren, University Park, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 6, 1974, Ser. No. 467,350

Int. Cl.² G04B *19/34*

U.S. Cl. 58—50 R **14 Claims**



1. An electronic timepiece in which display elements are energized to display time which is comprised of:

a. oscillator means for generating electrical time base pulses of a predetermined frequency;

b. means coupled to said oscillator means including a plurality of counter means driven by said time base pulses for counting said time base pulses and for producing counter outputs indicative of the second, minute and hour, each of said counter means including a pair of counters with one counter in each pair being a base-six counter serially connected to a second counter with the second counters for seconds and minutes being base-ten counters and with the second counter for hours being a base-two counter;

c. means including sequential enabling means coupled to said counter means for multiplexing said counter outputs;

d. a plurality of display elements each having first and second terminals arranged in predetermined patterns with twelve display elements in a first of said patterns for individually indicating one of 12 hours and 60 display elements in a second of said patterns for individualiy indicating one of 60 minutes and alternately one of 60 seconds, groups of said display elements of said second pattern being interconnected at one terminal thereof by common interconnects to form ten groups of six elements and the other terminal of each of said display elements of said second pattern being connected to one of six conductors in the order of each Nth element of each group connected to the Nth conductor; and

e. a plurality of sets of drivers with a first of said sets selectively coupling said counter outputs to said common interconnects and a second set selectively coupling said counter outputs to said six conductors to selectively display hours, minutes and seconds in accordance with the multiplexing of said counter outputs.

3,922,848

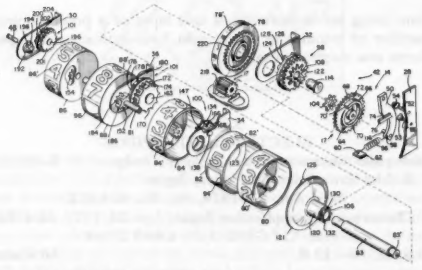
DIGITAL DISPLAY MECHANISM

Richard H. Weber, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Mar. 11, 1974, Ser. No. 449,696

Int. Cl.² G04B *19/02*

U.S. Cl. 58—125 C **13 Claims**



5. A digital clock comprising:

a. a case having a front face and a display window provided in said front plate,

b. a shaft rotatably journalled in said case,

c. constant speed drive means carried by said case and coupled to said shaft to rotate same,

d. a minutes display means rotatably carried on said shaft comprising a first wheel rotatably carried on said shaft having a first window through its outer periphery and indicia around said outer periphery to be displayed in said display window, and a second wheel rotatably carried by said shaft within said first wheel and having indicia around its outer periphery to be displayed through said first window and said display window,

e. intermittent advance means responsive to the rotation of said shaft,

f. first drive and synchronizing means coupled to said intermittent advance means and to each of said first and second wheels to intermittently advance each of said first and second wheels and to synchronize their advancement with respect to each other,

g. a tens-of-minutes display means rotatably carried by said shaft having indicia to be displayed in said display window,

h. a second drive and synchronizing means coupled between said minutes display means and tens-of-minutes display means to advance said tens-of-minutes display means and synchronize their advancement with respect to each other,

i. an hours display means comprising a third wheel rotatably carried on said shaft having a second window through its outer periphery and indicia around said outer periphery to be displayed through said display window, and a fourth wheel rotatably carried on said shaft within said first wheel having indicia around its outer periphery to be displayed through said second window and said display window, and

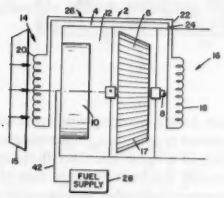
j. third drive and synchronizing means coupled to said tens-of-minutes display means and to each of said third and fourth wheels to intermittently advance each of said third and fourth wheels and to synchronize their advancement with respect to each other and said tens-of-minutes display means.

3,922,849

INJECTOR FOR GAS TURBINE COMBUSTOR

David L. Kors, El Dorado Hills, Calif., and Donald W. Culver, Richland, Wash., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Oct. 9, 1973, Ser. No. 404,445
Int. Cl.² F02C 7/10; F02G 3/00; B05B 1/24
U.S. Cl. 60—39.51 R 10 Claims



9. Fuel combustion apparatus for use with heat engines using liquid fuel comprising in combination: an air duct for flowing air, an engine rotor downstream of and in flow communication with the duct, heat exchange means for heating air flowing towards the rotor to a temperature greater than the vapor temperature of the liquid fuel, and a fuel injection disposed a short distance upstream of the rotor in the flow of air heated by the heat exchange means such that a relatively short combustion chamber exists between the injector and the rotor, the fuel injector having a multiplicity of thin vanes, means for mounting the vanes within the conduit, each vane including a fuel passage, means for connecting first ends of the passages with a source of liquid fuel, each passage terminating in at least one second fuel discharge opening, the passage having an extent in the direction of the air flow which is many times greater than its thickness in a direction perpendicular to the air flow, and a length which is sufficient to evaporate the fuel within the passage when the air flow is at said temperature, whereby vaporized fuel is discharged from the openings for an efficient, substantially instantaneous combustion of the fuel in the combustion chamber and prior to its entry into the rotor.

3,922,850

TURBINE ENGINE FUEL CONTROL

Ralph Patrick McCabe, Troy, Mich., assignor to Colt Industries Operating Corporation, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,819
Int. Cl.² F02C 9/10
U.S. Cl. 60—39.28 R 1 Claim

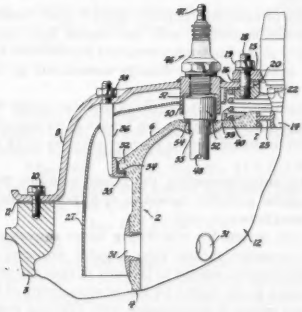
1. A control system for a gas turbine engine having an air inlet, a compressor, a turbine, a burner chamber, a power output shaft adapted for connection to a load, and a variable loading device capable of varying torque transmitted to the load at a given load speed, said system comprising, a control portion for providing efficient engine steady state operation and a control portion for providing compressor surge and over-temperature protection during transient engine operation such as starting, acceleration, and deceleration, said steady state control portion of said system comprising first operator — controlled means including engine speed governor means effective to maintain selected engine speed by varying fuel flow to the engine and second means to varying engine load to maintain a first desired predetermined relationship between compressor discharge pressure and a signal that is a function of air flow to the engine, said second means engine load control means, first pressure responsive means for sensing compressor discharge pressure, second separate pressure responsive means for sensing said engine airflow signal, control means for utilizing the said sensed compressor discharge pressure and said engine air flow signal to produce a pressure signal indicative of a first desired engine airflow signal and then comparing said first desired airflow pressure signal with said actual airflow signal, and first further means responsive to any difference between said first desired and said actual airflow signals to control said engine load control means, whereby actual engine airflow and compressor discharge pressure are changed to produce said first desired predetermined relationship, said transient state control portion of said system comprising said second means of said steady state control portion effective during starting and acceleration to reduce engine load and third means for simultaneously varying fuel flow to the engine to maintain a second at times different desired predetermined relationship between compressor discharge pressure and a signal that is a function of airflow to the engine so as to protect the engine from compressor surge and turbine over-temperature, said third means including engine fuel control means, said first pressure responsive means for sensing compressor discharge pressure, said second separate pressure responsive means for sensing said engine airflow signal, control means for utilizing said sensed compressor discharge pressure and said engine airflow signal to produce a pressure are indicative of a second desired airflow and then comparing said second desired airflow pressure signal pressure with said actual airflow signal and second further means responsive to any difference between said second desired and said actual airflow signals to control said engine fuel control means, whereby actual engine airflow and compressor discharge pressures are changed to produce said second at times different desired predetermined relationship, said second and third means being effective during engine deceleration to increase engine load and to vary fuel flow to the engine as a function of conpressor discharge pressure, respectively.

3,922,851

COMBUSTOR LINER SUPPORT

John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1974, Ser. No. 458,074
Int. Cl.² F02C 7/20, 7/00
U.S. Cl. 60—39.32 3 Claims



1. A combustion apparatus for a gas turbine engine having a housing including a wall; a combustion liner of ceramic material mounted within the housing and spaced from the housing to define a passage between the housing and liner for flow of combustion air into the liner, the liner having a side wall and a dome portion at the upstream end of the side wall both exposed to the said air flow; abutment means extending

from the housing wall and abutment means on the exterior of the upstream end of the side wall adjacent the dome bearing against the first-recited abutment means; and resiliently-biased means reacting against the housing wall and bearing against the central portion of the dome portion to press the liner against the first-recited abutment means and support the liner from the wall with freedom for relative expansion of the liner and the liner supporting means including the abutment means and the resiliently-biased means.

3,922,852

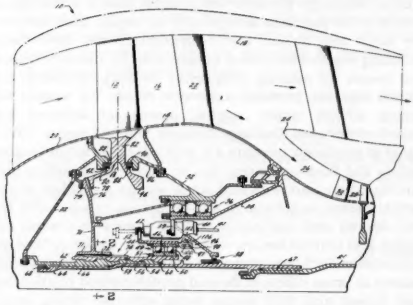
VARIABLE PITCH FAN FOR GAS TURBINE ENGINE

Stephen Drabek, Boxford, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Oct. 17, 1973, Ser. No. 407,222

Int. Cl.² F02C *3/06*; **F02K** *3/06*; **F01D** *7/00*; **B63H** *3/04*

U.S. Cl. 60—226 R **11 Claims**



1. A variable pitch fan and actuation apparatus for a gas turbine engine of the bypass type having a bypass duct and a fan drive shaft,

a static frame structure,

a fan frame structure mounted in driven engagement with the fan drive shaft for rotation about the static frame structure,

a plurality of circumferentially spaced apart variable pitch fan blades extending into the bypass duct and fixedly attached to the fan frame structure for rotation therewith,

linear actuator means fixedly connected to the static frame structure,

angular actuator means fixedly connected to the fan frame structure for rotating the fan blades in unison about their respective center axes to thereby vary the pitch of the fan blades,

means for interconnecting the linear actuator means and the angular actuator means so as to permit relative rotation therebetween, and

helical cam means for converting linear movement of the linear actuator means into angular movement of the angular actuator means to thereby permit the pitch of the fan blades to be varied by linear movement of the linear actuator means in accordance with differing engine operating requirements,

limit stop means connected to the linear actuator means for restricting the linear movement of the linear actuator means to predefined travel distances in order to provide limit stops beyond which the pitch of the fan blades cannot be varied,

inactivating means for inactivating the limit stop means so that the pitch of the fan blades may be fully varied.

3,922,853

SPEED CONTROL DEVICE

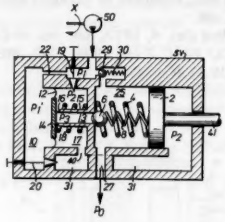
Hans Kalb, Nuremberg, Germany, assignor to AEG-Kanis Turbinenfabrik GmbH, Nurnberg, Germany

Filed June 13, 1974, Ser. No. 479,181

Claims priority, application Germany, June 15, 1973, 2331282

Int. Cl.² F15B *15/18*

U.S. Cl. 60—325 **6 Claims**



1. A speed control device working with hydraulic fluid and including a displacement type pump, comprising an adjustable orifice being the inlet of a valve chamber that communicates through said orifice with the high pressure side of said pump, and a differential pressure controller including a valve forming a first outlet of said valve chamber, said valve including a nozzle member and a throttle plate carried by a diaphragm and cooperating with the mouth of said nozzle member opening into said valve chamber, the said diaphragm being charged from within the valve chamber by a spring force, the said diaphragm and throttle plate being one wall of said valve chamber separating it from an additional chamber, the additional chamber communicating with the high pressure side of said displacement type pump and with a second, main outlet of said valve chamber through a throttling device, the said main outlet of said valve chamber delivering the control pressure actuating a piston of a servo-motor.

3,922,854

HYDRAULIC INSTALLATION WITH ENERGY STORING MEANS

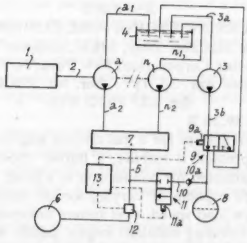
Yves G. Coeurderoy, Lagny-le-Sec, France, assignor to Societe Anonyme: Poclain, Le Plessis-Belleville, France

Filed Dec. 23, 1974, Ser. No. 535,820

Claims priority, application France, Jan. 14, 1974, 74.01175

Int. Cl.² F15B *1/02*

U.S. Cl. 60—413 **2 Claims**



1. A hydraulic installation comprising a motor driving at least one so-called main pump and at least one so-called auxiliary pump, the main pump discharging into at least one receiver and the delivery conduit of the auxiliary pump being connected to a pressure accumulator, wherein a first two-way distributor disposed in the delivery conduit of the auxiliary

pump ensures communication of said auxiliary pump, in its first position, with the accumulator, and in its second position with a tank, and wherein between said first distributor and the accumulator there is tapped a pipe connected to the feed conduit of the receiver and provided with a second two-way distributor ensuring, in its first position, the closure of said pipe and, in its second position, the opening thereof, whilst a fluid pressure sensor is disposed in the feed conduit of the receiver and controls, via a logic device, the selection of the positions of the first and second distributors.

3,922,855

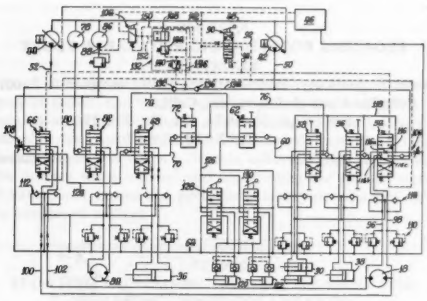
HYDRAULIC CIRCUITRY FOR AN EXCAVATOR

John W. Bridwell, Peoria; Donald L. Hopkins, and Kenneth R. Lohbauer, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 207,027, Dec. 13, 1971. This application Sept. 3, 1974, Ser. No. 502,829

Int. Cl.² F15B *13/06, 13/09*

U.S. Cl. 60—421 **16 Claims**



1. A hydraulic circuit for a hydraulic excavator comprising: a first and a second variable displacement pump for supplying pressurized fluid to said circuit;

a first series of series-connected distributor valves operatively connected for directing fluid from said first pump to a translation motor and to a first pair of implement control motors;

a second series of series-connected distributor valves operatively connected for directing fluid from said second pump to said translation motor and at least another implement control motor;

pilot control means for shifting said distributor valves for said translation motor in sequence;

said pilot control means including a source of pressurized pilot control fluid;

drive control means including pilot valve means operative to direct said pilot fluid for shifting said distributor valves controlling said translation motor and operative to vary the pressure of said pilot pressure over a wide range of pressures; and,

the first of said distributor valves being operative to shift progressively over a first range of pilot fluid pressures and the second of said distributor valves being operative to progressively shift over a second range of pilot fluid pressures so that the first pump is operative to supply fluid for low speed operation and fluid from said second pump is added to said first pump fluid for high speed operation.

3,922,856

CLOSED-CIRCUIT HYDROSTATIC AGGREGATE

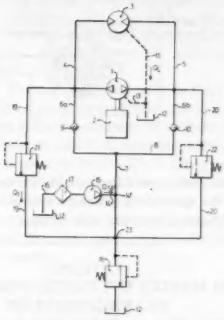
Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed July 1, 1974, Ser. No. 485,030

Claims priority, application Germany, July 24, 1973, 2337482

Int. Cl.² F15B *15/18*

U.S. Cl. 60—464 **1 Claim**



1. A closed-circuit hydrostatic aggregate, comprising a hydrostatic drive; a hydrostatic user; a reservoir for hydraulic fluid; a closed hydraulic circuit, including a circuit loop connecting said drive and said user and having a pressure-side branch and a suction-side branch each including a main branch portion connecting said drive and user and an auxiliary branch portion connecting the respective main branch portion with a loop portion, a one-way valve in each of said branches to prevent fluid flow towards said loop portion, said circuit further including a main conduit connecting said loop portion with said reservoir and having a first pressure-relief valve interposed in it for relieving pressure to said reservoir, and a pair of relief conduits each communicating with one of said branches and both communicating with said main conduit at a common junction point located intermediate said first pressure-relief valve and said loop portion, each of said relief conduits having a second pressure-relief valve interposed in it for relieving pressure in direction towards said junction point; and a fluid pump having a suction side communicating with said reservoir and a pressure side which communicates with said main conduit intermediate said loop portion and said junction point where said relief conduits communicate with said main conduit.

3,922,857

VEHICLE DUAL BRAKING SYSTEMS

Michael Albert Carey, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 2, 1973, Ser. No. 412,122

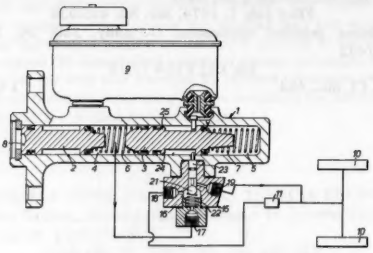
Claims priority, application United Kingdom, Nov. 17, 1972, 53322/72; Feb. 8, 1973, 6317/73

Int. Cl.² F15B *7/00*

U.S. Cl. 60—562 **7 Claims**

1. In a vehicle braking system comprising a master cylinder having primary and secondary pressure chambers and primary and secondary pistons slidable in said chambers, mechanical actuating means for effecting movement of said primary and secondary pistons to generate pressure in the respective chambers, first and second fluid pressure operated brakes operatively connected to the respective primary and secondary pressure chambers, a fluid pressure proportioning valve between said primary pressure chamber and the brake operatively connected thereto, disabling means for disabling the

proportioning effects of said proportioning valve, and means in said master cylinder for directly and positively operating said disabling means by the secondary piston upon predeter-



mined excess movement thereof in response to loss of fluid pressure in the secondary pressure chamber following operation of said pistons to apply said brakes.

3,922,858

TANDEM MASTER CYLINDERS FOR HYDRAULIC BRAKING SYSTEMS

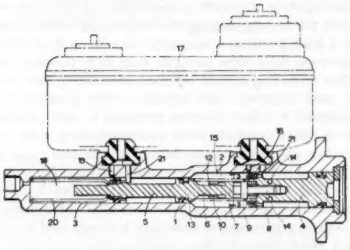
Francis Antony Dawson Sadler, Bromsgrove, England, assignor to Girling Limited, Birmingham, England

Filed Feb. 12, 1974, Ser. No. 441,873

Claims priority, application United Kingdom, Feb. 20, 1973, 8179/73

Int. Cl.² F15B *7/08*

U.S. Cl. 60—562 **3 Claims**



1. A tandem master cylinder for hydraulic braking systems for vehicles in which a pedal-operated main piston working in a part of the cylinder bore is coupled to a secondary piston working in another part of the bore by means limiting relative axial movement between the pistons in both directions and the pistons are urged apart by a spring, wherein the main and secondary pistons are interconnected by a split collet embracing heads on aligned axial stems on the pistons, said collet including axially spaced abutment means engageable by said heads; and serving to limit axial separation of the pistons.

3,922,859

CONTROL SYSTEM FOR A POWER PRODUCING UNIT

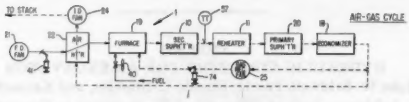
Oliver W. Durrant, Bath Township, and Robert R. Walker, Euclid, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 30, 1974, Ser. No. 465,705

Int. Cl.² F01K *13/02*

U.S. Cl. 60—665 **14 Claims**

1. In a control system for a power producing unit comprising a vapor generator and a turbine-generator supplied with vapor from said vapor generating unit, the combination comprising; a first means generating a first feed forward signal corresponding to the desired power output of the power producing unit, a second means responsive to said first feed forward signal generating a second feed forward signal proportional in value to said first feed forward signal modified by the difference between desired and actual power output of the power producing unit, a third means responsive to said second feed forward signal maintaining the rate of flow of vapor to the



turbine proportional to said second feed forward signal, a fourth means responsive to said first feed forward signal maintaining the pressure of the vapor admitted to said turbine at a set point value varying in a first functional relationship to said first feed forward signal and a fifth means responsive to said first feed forward signal maintaining the pressure in said vapor generator at a set point value varying in a second functional relationship to said first feed forward signal.

3,922,860

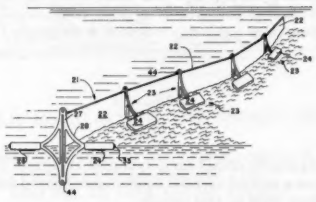
FLOATING BOOM HAVING ROTATABLE FLOAT ELEMENTS

Neeld D. Tanksley, Walnut Creek, Calif., assignor to Pacific Pollution Control, Emeryville, Calif.

Filed Sept. 30, 1974, Ser. No. 510,290

Int. Cl.² E02B *15/04*

U.S. Cl. 61—1 F **10 Claims**



1. In a floating boom having an elongated sheet-like partition, and a plurality of float means mounted to said partition at periodic intervals over the length thereof and formed to support said partition in a substantially vertical orientation, each said float means including at least one float element disposed on one side of said partition, the improvement comprising:

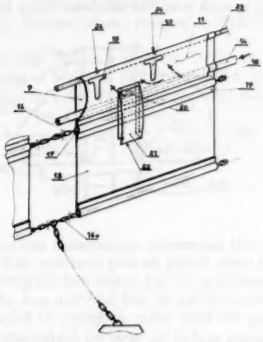
each said float element being mounted to the remainder of said float means and said float means being formed to permit angular displacement of said float element with respect to said float means to and from a deployed position and a relatively rotated stored position about a substantially horizontal axis extending in said deployed position substantially perpendicularly to said partition and passing substantially through the center of buoyancy of said float element to permit rotation thereof under dynamic fluid forces, said float element being further formed as a plate-like member oriented in a horizontal plane in said deployed position to provide a reduction of the overall bulk of said boom when said float element is in said stored position.

3,922,861

FLOATING MARINE BARRAGE

Andre Grihangne, 186, Avenue Victor Hugo, 75016 Paris, France

Filed June 19, 1974, Ser. No. 480,868
Claims priority, application France, June 21, 1973, 73.22756; May 2, 1974, 74.15287
Int. Cl.² E02B 15/04
U.S. Cl. 61—1 F 7 Claims



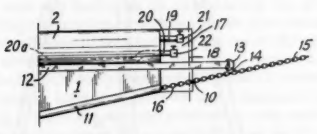
1. A floatable marine barrage including an elongate buoyancy chamber, and vent means comprising means defining a succession of orifices in the upper portion of said buoyancy chamber for expelling air from the buoyancy chamber when the vent means is open, a flexible inflatable pipe for closing the orifices when inflated and for opening the orifices when deflated, and means for positioning said pipe adjacent said succession of orifices.

3,922,862

FLOATING CONTAINING VESSELS OR DAMS FOR TRAPPING LIQUID POLLUTANTS

Jacques Vidilles, 24 boulevard Maillot, 92000 Neuilly, France

Filed July 10, 1974, Ser. No. 487,288
Claims priority, application France, Aug. 16, 1973, 73.29908
Int. Cl.² E02B 15/04
U.S. Cl. 61—1 F 8 Claims



1. Floating boom apparatus for collecting liquid floating on the surface of a body of water, said apparatus comprising elongate float means with an elongate strap member located along the length of said float means at the underside thereof, depending skirt means suspended from said float means, said skirt being constructed and arranged to be of substantially greater depth in the region between its ends than at each of its opposed ends, ballast means connected to the lower edge of the length of said skirt said ballast means comprising means extending beyond each end of said skirt for towing each end of said apparatus through said body of water, means connected to each end of said elongate strap member for adjustable connection of each end of said strap member to an adjacent portion of said towing member extending beyond each end of said float whereby said adjustable connection of each end of said strap to its adjacent towing member is effective to control the inclination of said downwardly depending skirt.

3,922,863

METHOD OF STORING HEAVY HYDROCARBON MATERIALS IN SUBTERRANEAN FACILITIES

D'Arcy A. Shock, and Fred J. Radd, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 18, 1975, Ser. No. 550,891
Int. Cl.² B65G 5/00; F17D 1/16
U.S. Cl. 61—.5 5 Claims

1. A method of storing in subterranean storage facilities a hydrocarbon material having a viscosity sufficiently high to resist free-flow which comprises:

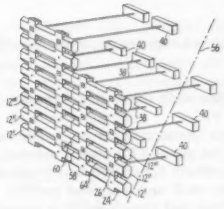
a. purging said storage facilities with a fluid comprising carbon dioxide to provide a carbon dioxide atmosphere;
b. admixing an effective amount of carbon dioxide with said hydrocarbon material to saturate same and reduce the viscosity of same to below 2500 centipoise.
c. injecting said carbon dioxide-saturated hydrocarbon material into said storage facilities; and,
d. maintaining said carbon dioxide atmosphere in said facilities while same contains said carbon dioxide-saturated hydrocarbon material.

3,922,864

STRINGER FOR RETAINING WALL CONSTRUCTION

William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Co., Eureka, Calif.

Filed Feb. 25, 1974, Ser. No. 445,233
Int. Cl.² E02D 17/00
U.S. Cl. 61—35 13 Claims



1. A stringer for a retaining wall comprising an elongate body having first and second spaced-apart stacking pads thereon, each said pad having an upper and a lower bearing surface thereon, one of said bearing surfaces having a concavity and the other said bearing surface having a convexity complemental to said concavity so that superposed stringers engage one another by engagement of the concavity and convexity in respective said bearing surfaces, said pads having a vertical extent exceeding the vertical extent of said bodies so that a space is defined between the bodies of adjacent stringers when vertically stacked with the pads thereon in engagement with one another.

3,922,865

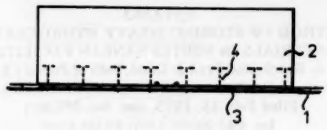
MATTRESS, METHOD OF SINKING A MATTRESS AND VESSEL SUITABLE FOR USE IN SAID METHOD

Ate Nijdam, Schelluinen, Netherlands, assignor to Aannemers, Combinatie Zinkwerken B.V., Gorinchem, Netherlands

Filed Sept. 10, 1973, Ser. No. 395,575
Claims priority, application Netherlands, Oct. 6, 1972, 7213540
Int. Cl.² E02B 3/12
U.S. Cl. 61—38 20 Claims

1. A mattress comprising a filter cloth, bars of metal, plastic or the like being woven in said filter cloth at regular intervals,

anchoring members being arranged so as to be linked to said bars woven in said cloth and extending from one face of said



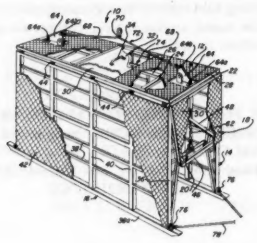
cloth, and concrete blocks cast on said filter cloth about said anchoring members.

3,922,866

WORKMEN'S CAGE FOR EXCAVATION WORK

Charles W. Benning, 200 Garfield, Denver, Colo. 80206

Filed July 8, 1974, Ser. No. 486,692
Int. Cl.² E21D *5/00*
U.S. Cl. 61—41 A **11 Claims**



1. A workmen's cage for excavation work comprising combination:

a top wall,

a pair of side walls depending from opposite side edges of the top wall,

pivot means connecting the top portion of one of said side walls to the top wall for pivotal movement of said one side wall selectively between a first position spaced from the other side wall and a second position wherein said one wall, below said pivot means, is pivoted inward convergent to said other wall,

means fixing the angular relationship of said other side wall to the top wall,

brace means extending between and interconnecting the side walls in downwardly spaced relation to said top wall, said brace means being selectively movable between an extended condition maintaining said one wall in the first position thereof and a collapsed condition whereby the brace means allows pivotal movement of said one side wall relative to the top wall, and

release means connected to said brace means and operable from above said top wall for releasing said brace means from said extended condition and allowing pivotal movement of the lower portion of the one side wall toward the other while a fixed spacing is retained between the top edges of the side walls.

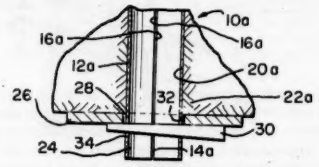
3,922,867

FRICTION ROCK STABILIZERS

James J. Scott, Lecoma Star Rte., Rolla, Mo. 65401

Continuation-in-part of Ser. No. 430,695, Jan. 4, 1974, which is a continuation-in-part of Ser. No. 330,954, Feb. 9, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,310
Int. Cl.² E21D *21/00, 20/00*
U.S. Cl. 61—45 B **7 Claims**

1. A friction stabilizer for insertion in a bore in a structure such as a roof or side wall of a mine shaft or other underground opening for anchoring the structure, said stabilizer comprising a generally annular body from end-to-end having a slot through its thickness, said body including edge portions extending along opposite sides of said slot and relatively arranged to permit substantial circumferential compression of said body, said body being of outer diameter predetermined to be substantially larger than the diameter of the bore in which it is to be inserted such that insertion of said body in such bore causes substantial circumferential compression of said body, said body being dimensioned to be plastically deformed during its insertion in such bore, the stabilizer being free of structure



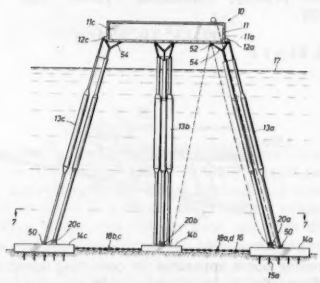
precluding said substantial compression and plastic deformation of said body during its said insertion, said body being of material permitting its said substantial compression and plastic deformation during its said insertion and, after such insertion, causing the body outer periphery to frictionally engage the surrounding wall of the bore for frictionally anchoring the structure, the ratio of the length of said body to the outer diameter thereof being at least about 16 to 1, the ratio of the radial thickness of said body to the outer diameter thereof being at a maximum about 1 to 5 and at a minimum about 1 to 50, and the outer circumferential dimension of said body being at least two inches.

3,922,868

DEEP WATER PLATFORM CONSTRUCTION

Reagan W. McDonald, and Walter B. Joseph, both of Houston, Tex., assignors to Reagan W. McDonald, Houston, Tex.

Filed Aug. 27, 1974, Ser. No. 500,913
Int. Cl.² E02D *21/00*
U.S. Cl. 61—46.5 **13 Claims**



1. A method for erecting a marine platform at a deep water offshore location site where the platform consists of a surface platform module and at least three supporting leg modules, the method comprising the steps of

floating each of platform and supporting leg modules independently to an offshore site,

at a given offshore site, pivotally interconnecting the leg modules at one of their ends to the platform module,

increasing the density of said leg modules at their other ends so as to pivot said leg modules about the pivotal interconnection until said other ends of said leg modules are in engagement with the ocean floor,

after said other ends of said leg modules are in engagement with the ocean floor, decreasing the density of the upper ends of said leg modules and pivoting said leg modules further about the pivotal interconnection to raise said platform member above the surface of the water.

3,922,869

PUMPED EVACUATED TUBE WATER HAMMER PILE DRIVER METHOD

Serge S. Wisotsky, Sharon, Mass., assignor to Orb, Inc., Marion, Ohio

Division of Ser. No. 267,741, June 30, 1972, which is a continuation-in-part of Ser. No. 163,422, July 16, 1971. This application July 31, 1974, Ser. No. 493,421

Int. Cl.² E02D 7/00

U.S. Cl. 61—53.5 4 Claims

1. In the driving of a pile in an ambient fluid, including water or air, said pile having its tip embedded in the ground, a closed evacuatable enclosure with side walls and a barrier at one end being effectively coupled with the tip of the pile for transmitting driving forces exerted upon said barrier to said tip, the method which comprises: pumping out of said enclosure liquid, and at least a portion of any gases and vapors which may be present therein, for evacuating said enclosure sufficiently to provide space for acceleration and deceleration of a mass of liquid adequate to produce the necessary force and energy for driving said pile; maintaining said enclosure closed to said ambient fluid at least during said evacuation;

opening valve means through the wall of said enclosure; accelerating through said opening a substantially load-velocity independent flow of liquid into the evacuated portion of the enclosure; causing said flow to move toward said barrier with its principal component of energy and motion along the longitudinal axis of the enclosure toward the barrier for impacting against same directly or indirectly; suddenly decelerating said mass against said barrier with the liquid substantially at its theoretical bulk modulus, and thereby converting hydraulic kinetic energy to a liquid hammer driving pulse for driving said pile deeper into said subsoil; and repetitively evacuating, accelerating, decelerating and driving as aforesaid.

3,922,870

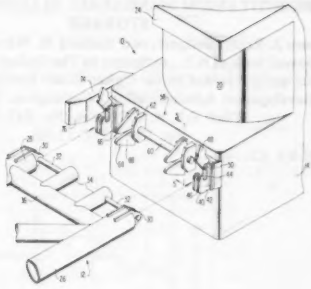
STINGER LATCHING APPARATUS

Carlos Eduardo Recalde, Garden Grove, Calif., assignor to Santa Fe International Corporation, Orange, Calif.

Filed Oct. 24, 1974, Ser. No. 517,757

Int. Cl.² B63B 35/04; E05D 1/06

U.S. Cl. 61—72.3 37 Claims



1. Apparatus for connecting a pipeline support to a pipelaying barge comprising:

support structure forming part of the barge;

a latch carried by said support structure and having a slot for receiving a connecting element carried by the pipeline support;

a guide pivotally carried by said support structure and having a slot for receiving the pipeline support connecting element;

said guide being pivotal from a first position with the guide slot in misalignment with said latch slot into a second position with said guide slot and said latch slot in registration one with the other thereby enabling guided movement of the connecting element, when received in the guide slot, into said latch slot; and

means carried by said support structure for releasably retaining the connecting element in said latch slot.

3,922,871

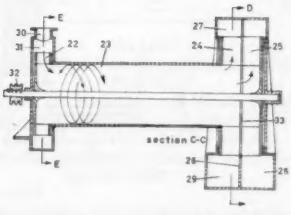
HEATING AND COOLING BY SEPARATION OF FASTER FROM SLOWER MOLECULES OF A GAS

Dmytro Bolesta, 9 Jessie St., Sunshine, 3020, Victoria, Australia

Filed Apr. 15, 1974, Ser. No. 461,118

Int. Cl.² F25B 9/02

U.S. Cl. 62—5 6 Claims



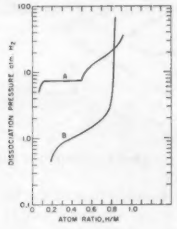
1. An apparatus for changing the temperature of a gas which comprises; a cylinder, a vaned inlet for gas formed in such a way that a gas enters through it into said cylinder performing whirling vortex like motion, means for dividing whirling gas into desired number of portions formed by strata of vortex, means for bringing the pressure of each portion of said gas to desired pressure at which portion of gas collected

from stratum of vortex located more distant from centre of vortex becomes cooler and portion of gas collected from stratum of vortex located nearer the centre of vortex becomes warmer than original gas, and means for exhausting said portions of gas separately from the apparatus.

3,922,872
IRON TITANIUM MANGANASE ALLOY HYDROGEN STORAGE

James J. Reilly, Bellport, and Richard H. Wiswall, Jr., Brookhaven, both of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 4, 1975, Ser. No. 547,073
Int. Cl.[2] F17C *11/00*
U.S. Cl. 62—48 **4 Claims**

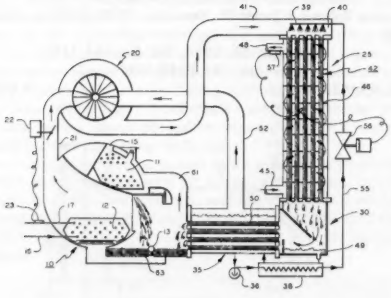


2. The method of storing hydrogen comprising contacting a solid alloy of $TiFe_{1-x}Mn_x$ where x is in the range of about 0.02 to 0.5 with gaseous H_2 at a pressure above the dissociation pressure of the hydride.

3,922,873
HIGH TEMPERATURE HEAT RECOVERY IN REFRIGERATION

Louis H. Leonard, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,639
Int. Cl.[2] F25B *43/02*
U.S. Cl. 62—84 **24 Claims**



1. The method of developing a high temperature lift at the discharge of a compressor as employed in a vapor compression refrigeration system including

exposing refrigerant vapors discharged from the compressor to a concentrated absorbent solution to develop temperatures in the mixture above the saturation temperature of the refrigerant, and

transferring the high temperature heat energy to a substance for recovery thereof.

8. The method of developing a high temperature lift in a refrigeration system employing a vapor compressor including exposing a strong absorbent solution to the refrigerant vapors discharged from the vapor compressor to develop a high temperature mixture which is at a temperature level above that of the discharge vapors,

transferring the heat energy in the high temperature mixture to a heat reclaiming substance whereby the temperature of the reclaiming substance is raised to about that of the high temperature mixture,

separating the diluted solution from the unabsorbed vapors after heat transfer,

flash cooling the separated dilute solution by exposing the solution to the low pressure inlet to the compressor,

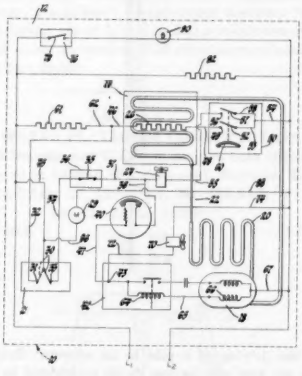
placing the unabsorbed refrigerant vapors in thermal communication with the flash cooled solution to condense the vapors whereby refrigerant is boiled from the solution thus reconcentrating the solution, and

recirculating the reconcentrated solution to the compressor discharge for reuse.

3,922,874
EVAPORATOR FAN DELAY CIRCUIT

James A. Canter, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,692
Int. Cl.[2] F25D *21/08*
U.S. Cl. 62—155 **3 Claims**



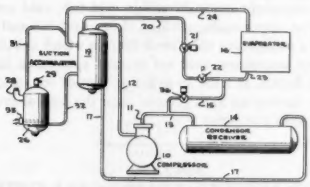
1. In combination, a refrigerator cabinet having an insulated above-freezing food storage compartment and a freezer food storage compartment therein, a source of electrical power, an evaporator positioned in the freezer compartment, means including a freezer fan for circulating air through the compartments in thermal exchange relationship with said evaporator, a compressor for supplying liquid refrigerant to said evaporator, temperature responsive cold control switch means connecting said compressor to said power source, defrost timer means for periodically defrosting said evaporator including an electric defrost heater arranged in thermal exchange relationship with said evaporator, said timer means including a single pole double throw switch for selectively energizing either said compressor or said electric defrost heater, a single throw double pole defrost limiter thermostatic switch having a first set of contacts connecting one side of said power source in series circuit with said defrost heater to the other side of said power source, said defrost limiter switch having a second set of contacts connecting one side of the power source in series circuit with said freezer fan, said cold control switch means, and said defrost timer means to the other side of the power source during a cooling cycle; whereby upon the said defrost limiter thermostatic switch sensing a predetermined evapora-

tor temperature above freezing, said defrost limiter switch first and second set of contacts simultaneously opening deenergizing said defrost heater and disconnecting said freezer fan from said one side of said power source, respectively; and said defrost limiter switch first and second set of contacts simultaneously closing at a predetermined temperature below freezing, whereby said freezer fan is energized by virtue of the said closed second set of contacts completing a circuit from said one side of said power source through said fan, said cold control switch means and said defrost timer switch means to the other side of said power source while said defrost heater is removed from the one side of said power source by said defrost limiter switch until the next defrost cycle initiated by said defrost timer switch means.

3,922,875
REFRIGERATION SYSTEM WITH AUXILIARY DEFROST HEAT TANK

William F. Morris, Jr., 801 Fayetteville St., Raleigh, N.C. 27601

Filed Sept. 12, 1974, Ser. No. 505,347
Int. Cl.² F25D *21/06*
U.S. Cl. 62—156 **20 Claims**

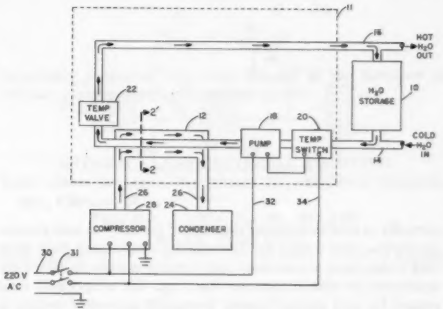


1. A refrigeration system adapted to cycle alternately through a refrigeration cycle and a defrost cycle, comprising a compressor having discharge and suction ports, a condenser connected to the discharge port to receive refrigerant gas from the compressor during the refrigerant cycle and condense the same, an evaporator having an inlet connected to the condenser to receive condensed liquid refrigerant therefrom during the refrigeration cycle and having an outlet, hot gas conduit means for conveying gaseous refrigerant from the compressor to the evaporator during the defrost cycle, a suction accumulator tank connected by an outlet suction line to the suction port of the compressor and by an inlet suction line to the evaporator outlet for receiving any liquid refrigerant discharged from the evaporator outlet toward the compressor and having means for conveying warm liquid refrigerant coursing from the condenser to the evaporator therethrough in heat exchange relation with liquid refrigerant in the accumulator tank received from the evaporator outlet to vaporize the latter, an auxiliary defrost heat tank connected to said suction accumulator tank substantially filled with a heat storage liquid and having a conduit coil immersed therein connected by a feed line to said accumulator tank at a location slightly above a reference liquid level therein normally reached by the liquid refrigerant during the refrigeration cycle to convey liquid refrigerant during the defrost cycle to the heat tank only when the liquid refrigerant level in the accumulator tank exceeds said reference level, means for heating said heat storage liquid in said heat tank to a sufficient temperature for promptly vaporizing any liquid refrigerant conveyed into said conduit coil therein, and a heat tank outlet conduit for return of the vaporized refrigerant from the conduit coil in the heat tank to the suction port of said compressor.

3,922,876
ENERGY CONSERVATION UNIT

Thomas I. Wetherington, Jr., St. Petersburg; McKay Goode, Longwood, and Colin D. Burgess, Maitland, all of Fla., assignors to Energy Conservation Unlimited, Inc., Longwood, Fla.

Filed Nov. 21, 1974, Ser. No. 525,962
Int. Cl.² F25D *17/00*
U.S. Cl. 62—180 **12 Claims**



1. An energy transfer system for use with refrigeration means and a water reservoir, said refrigeration means of the type having a compressor and a compressible refrigerant flowing through an output from said compressor, said energy transfer system comprising:

heat exchange means coupled in said output of said compressor and to said water reservoir for receiving water from said reservoir and transferring heat from said refrigerant thereto;

a pump interposed between said reservoir and said heat exchange means for pumping water therebetween;

temperature sensing means thermally coupled to water passing through said pump and electrically coupled to said pump for rendering said pump inoperative when the temperature of said water is at or above a preselected temperature;

a return water line coupled between said heat exchange means and said water reservoir;

a temperature sensing valve interposed in said return line between said heat exchange means and said water reservoir, and in close proximity to said heat exchange means for preventing water from exiting said heat exchange means until said water is at, or above a predetermined temperature; and wherein

said heat exchange means effects a reduction in the temperature of said refrigerant from said compressor and an increase in the temperature of water passing back into said reservoir.

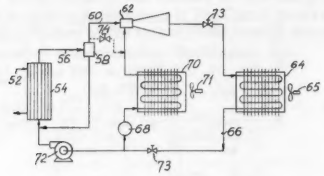
3,922,877
AIR CONDITIONING SYSTEM FOR AUTOMOTIVE VEHICLES

Abraham Ophir, 34, Neve Oved St., Herzlia Pituah, and Joseph Weinberg, 29 Brodetsky St., Tel Aviv, both of Israel

Filed July 22, 1974, Ser. No. 490,693
Claims priority, application Israel, Oct. 3, 1972, 40492
Int. Cl.² F25B *27/02*
U.S. Cl. 62—238 **2 Claims**

1. In an air conditioner for cooling a motor vehicle passenger compartment, said vehicle having an engine with means emitting hot exhaust gases therefrom, a closed refrigerant fluid system containing a refrigerant fluid and utilizing the heat of said exhaust gases for powering said air conditioner comprising condenser means for liquifying said refrigerant fluid, evaporator means for vaporizing said refrigerant fluid and for effecting cooling of air passed therethrough by heat transfer from said air to said fluid, means for passing cooling

air through said evaporator means and to said passenger compartment, generator means receiving said fluid in liquified form for effecting heat transfer from said engine exhaust gases to said liquified fluid to effect evaporation thereof, means for passing said exhaust gases through said generator means, ejector means located within said closed refrigerant system receiving evaporated fluid from said generator means and passing said fluid to said condensor means, recirculation means for passing liquified fluid from said condensor means



partially to said evaporator means and partially to said generator means, and means for introducing evaporated fluid from said evaporator means into said ejector means to effect entrainment of said introduced fluid into the evaporated fluid passed by said ejector means from said generator means to said condensor means, said ejector means comprising means defining a low pressure side thereof at which said evaporated fluid from said evaporator means is introduced into said ejector means, and means defining an acceleration zone in which the velocity of entrained fluid is accelerated.

3,922,878

PORTABLE COOLING UNIT

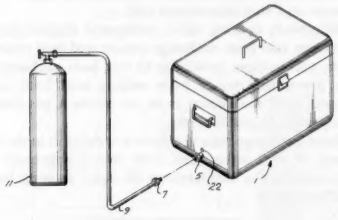
Javid Jalali (Karchay), 309 N. Maidson, Monrovia, Calif. 91016

Filed Jan. 10, 1975, Ser. No. 540,071

Claims priority, application Australia, Jan. 11, 1974, 6221/74

Int. Cl.² F25D *3/12*

U.S. Cl. 62—384 **5 Claims**



1. A portable cooling unit comprising:

an insulated container having first and second compartments therein and means defining a wall between the compartments; the first compartment for storing material to be cooled; the second compartment having at least one hollow block concealed therein for containing dry ice formed in situ, and further having a conduit therein for carrying liquid carbon dioxide under pressure;

an exhaust port exposing the second compartment to atmospheric pressure;

a fitting on the container and communication with one end of the conduit for releasable connection to external tubing through which the liquid carbon dioxide is supplied; and

each hollow block having an inlet port connected to the conduit for the liquid carbon dioxide to flow through into the hollow block, and having a plurality of apertures each for exposing liquid carbon dioxide in the hollow block to the pressure existing in the second compartment so as to provide for the formation of dry ice inside the hollow block.

3,922,879

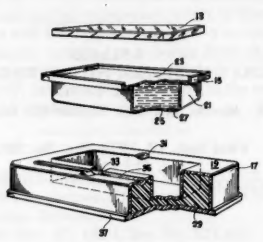
PORTABLE REFRIGERATED WORK HOLDER

George R. Arnold, Napa, Calif., assignor to Silverado Industries, Inc., Napa, Calif.

Filed May 9, 1974, Ser. No. 468,253

Int. Cl.² F25D *13/00*

U.S. Cl. 62—458 **9 Claims**



1. A refrigerated work holder comprising,

an insulated tub,

a closed container nestable within said tub, said container having an upper surface which closes said tub and further having a refrigerant substance therein which substantially fills said container, said refrigerant substance having a heat of fusion at least as great as that of ice, said upper surface having an area greater than the lateral cross-section of said container.

3,922,880

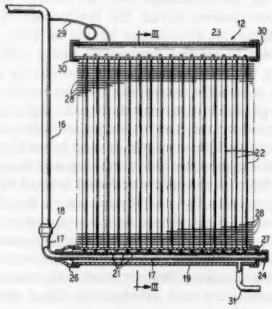
FLOODER REFRIGERANT CONDENSER SYSTEMS

Herman H. Morris, P.O. Box 3129, Chattanooga, Tenn. 37404

Filed Mar. 11, 1974, Ser. No. 449,734

Int. Cl.² F25B *1/00*

U.S. Cl. 62—498 **11 Claims**



1. A condenser assembly adapted for use in a mechanical refrigeration system of the vapor compression type comprising:

a fluid tight housing means having defined therein

an interior chamber portion adapted to be located in a gravitationally bottom region of said housing,

input port means and output port means located in said bottom region in laterally spaced relationship,

wall member portions adapted to be located above said interior chamber portion, said wall members being adapted for heat transfer therethrough when a heat

exchange fluid contacts outer surfaces thereof relative to interior portions of said housing means;

an input conduit associated with said input port means and adapted to extend thereto from a position located above a predetermined fluid level in said housing when said condenser assembly is functioning; and

pressure equalization means extending between a gravitationally top region of said housing and said input conduit at said position,

said pressure equalization means comprising a capillary tube.

3,922,881

HELIUM 3-HELIUM 4 DILUTION REFRIGERATOR

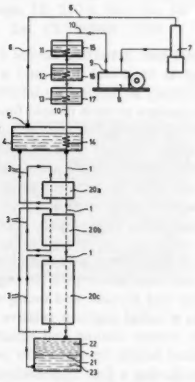
Frans Adrianus Staas, and Adrianus Petrus Severijns, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,278

Claims priority, application Netherlands, Nov. 13, 1973, 7315487

Int. Cl.² F25B 1/00

U.S. Cl. 62—502 7 Claims



1. In a ^3He — ^4He dilution refrigerator for temperatures below the λ point of helium, including first means for condensing and cooling gaseous helium into concentrated liquid ^3He, a mixing chamber containing concentrated ^3He and superfluid dilute ^3He, a distillation chamber for separating dilute ^3He into ^3He and ^4He, and a supply duct for flowing concentrated liquid ^3He from said first means to said mixing chamber, and a return duct for flowing dilute ^3He from said mixing chamber to said distillation chamber, the improvement in combination therewith of a continuous heat exchanger comprising adjacent and parallel, concurrent oriented portions of said supply and return duct in heat-exchange relationship.

3,922,882

POWER TRANSMISSION ASSEMBLY FOR USE IN MOTOR VEHICLES

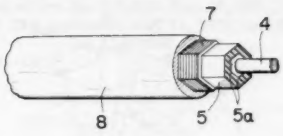
Isao Kimata, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Oct. 2, 1973, Ser. No. 402,764

Int. Cl.² F16C 1/02

U.S. Cl. 64—2 R 2 Claims

1. A power transmission assembly for use in motor vehicles, comprising a tubular member having an inner face with a hexagonal cross section to form six corner sections to contain a lubricant, and a flexible shaft of circular cross section which



is entirely supported with only the aid of the lubricant in coaxial alignment with the tubular member.

3,922,883

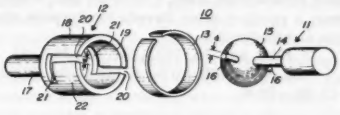
ANTI-BACKLASH UNIVERSAL COUPLING

Louis Albert Bevacqua, Des Plaines, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,838

Int. Cl.² F16D 3/02

U.S. Cl. 64—7 8 Claims



1. A universal coupling having

a male member,

a female member,

the male member having a head with a plurality of pins extending therefrom,

and the female member provided with a cavity and engaging slots,

each pin being received within a respective one of the slots, the head being substantially enclosed within the cavity,

wherein the improvement comprises

the pins being oversize relative to the slots to provide an interference fit therebetween,

the female member being provided with a plurality of relief slots such that the portions of the female member adjoining the engaging slots can independently flex upon engagement of the pins within the slots, and

the relief slots being circumferential slots formed in a plane perpendicular to the longitudinal axis of the cavity and extending a predetermined distance from the innermost extent of the engaging slots,

whereby the members are substantially constrained to move about their longitudinal axis in unison but are substantially free to move angularly relative to each other.

3,922,884

COUPLINGS

Charles Wallace Chapman, Winchelsea, England, assignor to Charles W. Chapman (Consultants) Limited, Horley, England

Filed Nov. 30, 1973, Ser. No. 420,540

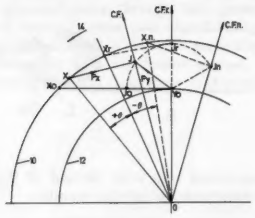
Claims priority, application United Kingdom, Dec. 1, 1972, 55595/72; Feb. 1, 1973, 5096/73; July 26, 1973, 35546/73

Int. Cl.² F16D 3/51

U.S. Cl. 64—19 13 Claims

1. A rotatable coupling comprising a driving and a driven member rotatable about a common axis and between which is connected one or more coupling elements for transmitting torque from the driving to the driven member, the or each coupling element being arranged so that rotational deflection of the driving member relative to the driven member cannot take place in the direction of drive when the coupling is rotat-

ing below a predetermined speed, and to allow rotational deflection of the driving member relative to the driven mem-



ber in either direction of rotation when the coupling rotates at a speed above the predetermined speed.

3,922,885

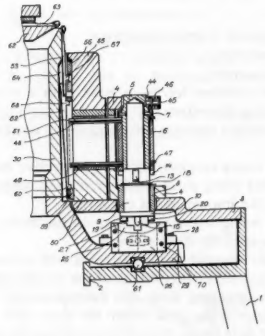
APPARATUS FOR CONTROLLING PATTERN DRUMS PARTICULARLY IN CIRCULAR KNITTING MACHINES

Miroslav Brandstatter, Brno, Czechoslovakia, assignor to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Aug. 13, 1973, Ser. No. 388,243

Int. Cl.[2] D04B *15/74;* **F16D** *11/04, 19/00*

U.S. Cl. 66—50 B **4 Claims**



1. A program control device for a knitting machine having a frame, said control device comprising a program drum arranged rotatably on the frame of the machine, a cylindrical body supported coaxially on said program drum at one end thereof, the end of the cylindrical body confronting the program drum being provided with a transverse recess, a coupling pawl pivotally supported in said recess, a plurality of slots provided on the end face of the program drum which confronts the cylindrical body, the coupling pawl being adapted temporarily to connect the cylindrical body with the program drum by engagement of one end of the coupling pawl in one of said slots in the program drum, a sliding guide on the other end of the cylindrical body remote from the program drum, a plurality of extensions arranged on said sliding guide, a plurality of control wedges with lateral surfaces arranged on a machine part adjustably as to their axial height opposite to the sliding guide, a plurality of return wedges arranged on said machine part, the control wedges performing a relative movement with respect to the program drum for engagement with said extensions of the sliding guide, and means for controlling the position of the coupling pawl in said cylindrical body for selectively connecting the cylindrical body with the program drum and disconnecting it therefrom.

3,922,886

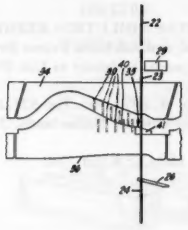
JACK MECHANISM FOR CIRCULAR KNITTING MACHINES

James D. Moyer, Winchester, Va., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1973, Ser. No. 396,065

Int. Cl.[2] D04B *9/00, 15/32*

U.S. Cl. 66—50 R **1 Claim**



1. An improved jack actuating device for circular knitting machines having at least one feed and a rotatable cylinder with slots for slidably mounting a circular series of needles adapted to knit courses at each of said feeds in forming tubular fabric, needle actuating jacks slidably mounted in each of said slots including a lifter jack and a slider jack, said slider jack having selector butts at a plurality of levels thereon which are selectively movable by corresponding pattern controlled selector slide cams in an upward direction to select said needles for knitting courses at said each feed, the improvement comprising:

a. a rocker jack member in said each slot intermediate said lifter jack and said slider jack having an operating butt adjacent one end thereof and being movable in a radial direction to a radial position relative to the axis of said cylinder by presser means and selectively upward to a predetermined height by said slider jack;

b. cam means having a first cam surface for engaging said operating butt of said rocker jack member when selectively raised said predetermined height by said slider jack to move said rocker jack member to an actuation height to position its corresponding said lifter jack and said needle for said knitting; and

c. a second cam surface of said cam means for directing said rocker jack member when not selectively raised said predetermined height by its said slider jack inwardly from said radial position effected by said presser means to an inactive position to pass below and in front of said first cam surface.

3,922,887

POSITIVE YARN FEEDING SYSTEM FOR CIRCULAR KNITTING MACHINE

Lester Mishcon, Miami Beach, Fla., assignor to The Singer Company, New York, N.Y.

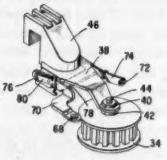
Filed Sept. 13, 1974, Ser. No. 505,828

Int. Cl.[2] D04B *15/48*

U.S. Cl. 66—132 T **1 Claim**

1. In a yarn feeding system for a knitting machine, the combination comprising an endless belt to be driven by the knitting machine, the belt having trapezoidly shaped teeth, a plurality of gear-like wheels over which the belt extends and which are driven by the belt, the wheels having spaced cogs which mesh with teeth on the belt, and means at each wheel

for guiding a yarn between the belt and the wheel where the yarn is gripped between the meshing parts of the belt and the



wheel and moved at a speed determined by the speed of the belt.

3,922,888

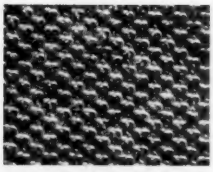
WARP KNIT TWILL, SHARKSKIN AND PIQUE FABRICS

Thomas E. Patterson, Pickens, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Sept. 11, 1974, Ser. No. 505,037

Int. Cl.² D04B 21/00

U.S. Cl. 66—192 34 Claims



1. A warp knit fabric comprising a first set of yarns forming a knit ground structure containing stitch loops in every course and wale, and second and third sets of yarns laid into the ground structure; each respective yarns of said second set primarily lying in one respective wale of the ground structure and periodically extending toward an adjacent wale, passing around at least two lap portions of one of the yarns of the ground structure, which lap portions otherwise extend in directions away fromthe portion of the yarn of the second set which extends toward the adjacent wale, and displacing those laps toward the wale in which the yarn of said second set is primarily lying; each respective yarn of said third set primarily lying in a respective wale of the ground structure and periodically extending toward an adjacent wale, passing around at least two lap portions of one of the yarns of the ground structure, which lap portions otherwise extend in directions away from the portion of the yarn of the third set which extends toward the adjacent wale, and displacing those laps toward the wale in which the yarn of said third set is primarily lying; the yarns of the second and third sets making all their periodic extensions in the same direction, but with the yarns of the third set making their periodic extensions in different courses from the courses in which the yarns of the second set make their periodic extensions; said second and third sets of yarns being substantially covered by the yarns of the ground structure, and said fabric having a surface effect on at least one face thereof which appears to extend along line oblique to the course and wale directions in the fabric.

3,922,889

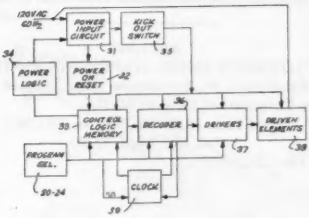
DIGITAL LOGIC CONTROL FOR AUTOMATIC WASHER

Joseph Karklys, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 211,885, Dec. 27, 1971, Pat. No. 3,783,651. This application May 11, 1973, Ser. No. 359,548

Int. Cl.² D06F 33/02

U.S. Cl. 68—12 R 6 Claims



1. A control circuit for an automatic clothes washer having a rotatable receptacle adapted to receive material, a drive motor coupled to the receptacle and operable to impart rotary motion thereto and material treatment means operatively associated with the receptacle, said control circuit comprising:

a clock for connection to a supply of alternating voltage, said clock operable to provide clock pulses indicative of elapsed time in response to the alternating wave of the supply;

a memory operable to provide a sequence of unique binary states representing the sequence of operations of a laundry program; and

a logic control circuit connected between said clock and memory having outputs connected to and the drive motor and material treatment means to control the operation of the drive motor and treatment means in accordance with the laundry program, said logic control circuit including indexing means connected to said memory and operable in accordance with unique combinations of elapsed time and memory state to index said memory; and

selectively operable switch means connected between said clock and said indexing means for establishing selected times for indexing said memory.

3,922,890

INNER BASKET FOR DEHYDRATING WASHING MACHINE

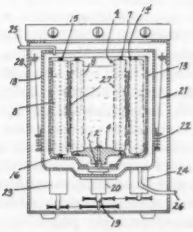
Masaji Shibata, 23, No. 30, Kamishima-cho, Kadoma, Osaka, Japan

Filed Oct. 23, 1973, Ser. No. 409,021

Claims priority, application Japan, Oct. 21, 1972, 47-105699

Int. Cl.² D06F 9/00, 23/04

U.S. Cl. 68—23 3 Claims



1. A washing machine having an independently driven oscillating shaft and an independently driven perforated basket for

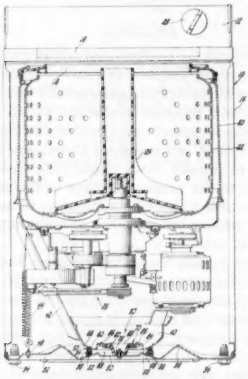
centrifuging the articles washed, a first hollow cylindrical member having a relatively thick wall of soft water-permeable material mounted on the shaft and located coaxially within the perforated basket, a second hollow cylindrical member having a relatively thick wall of soft water-permeable material and having a diameter larger than said first cylindrical member and smaller than the perforated basket freely interposed between said first member and the perforated basket and spaced outwardly from said first member sufficiently to define an annular space for insertion therein of articles to be washed.

3,922,891

CLOTHES WASHER SUSPENSION SYSTEM

John A. Sundstrom, Jr., Springboro, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 28, 1974, Ser. No. 483,962
Int. Cl.[2] D06F *35/00*
U.S. Cl. 68—23.3 **5 Claims**



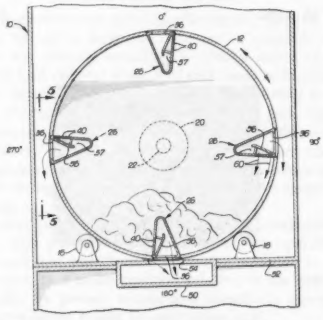
1. In combination with a washing machine having a movable mass including a rotatable spin tub adapted to contain clothes or the like in a washing fluid, an oscillatable agitator in said tub and a mechanism operable to horizontally oscillate said agitator for agitating said clothes or the like in said washing fluid and to rotate said spin tub for centrifugally removing the washing fluid from said clothes or the like durinng operation of said washing machine, a suspension system comprising: a fixed support member having an upwardly facing annular convex portion, a movable support member having a downwardly facing annular convex portion, said movable mass being secured in fixed relationship to said movable support member, an annular shuttle member located between said upwardly facing convex portion and said downwardly facing convex portion and having an internal wall defining a cavity between said support members, at least a portion of each of said convex portions located within said cavity, said shuttle member having an upper bearing portion in mating engagement with said downwardly facing convex portion to form a first interface, said shuttle member having a lower bearing portion in mating engagement with said upwardly facing convex portion to form a second interface, both of said interfaces being located below the center of gravity of said movable mass, said shuttle member being controlled in its movement relative to said fixed support member and said movable support member by forces applied through the interfaces by the pinching effect of said fixed support member and said movable support member, said movement of said shuttle member facilitating the closest possible proximity of said movable support member to said fixed support member within said cavity, and biasing means tending to center and vertically orient said movable mass and resist the twisting thereof, said biasing means including first spring means between said fixed support member and said movable support member outboard of said shuttle member and a second spring means in said cavity between said fixed support member and said movable support member, said second spring means being formed as a hat-shaped rubber cup interconnecting said support members inboard of said shuttle member, the crown of said hat-shaped rubber cup having means for fastening to one of said support members while the brim of said hat-shaped cup has means in combination with the other of said support member to fasten to the other of said support members, whereby during operation of said washing machine both of said spring means tend to center said movable support member with respect to said fixed support member to vertically orient said movable mass while said second spring means tends to counteract the twisting of said movable mass in response to the horizontal oscillations of said agitator, and whereby during shipment of said washing machine said second spring means delimits the sidewise excursions of said movable support member with respect to said fixed support member.

3,922,892

SUSPENSION SYSTEM FOR A WASHING MACHINE

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 20, 1974, Ser. No. 481,210
Int. Cl.[2] D06F *23/04, 37/24*
U.S. Cl. 68—23.3 **3 Claims**



1. In a vertical axis washing machine having a cabinet including a base and further having a movable mass including a rotatable basket and means for imparting oscillation and rotation to the movable mass, a damped, gyratory suspension system of the shifting nodal type for supporting the movable mass on the base, comprising:

a pair of relatively movable engaging planar surfaces, one of the planar surfaces being rigidly secured substantially horizontally to the washing machine base;

a pair of relatively movable engaging spherical surfaces, one of the sperical surfaces being secured coaxially concentric with the movable mass through the vertical axis thereof such that the center of gravity of the movable mass is above the engaging spherical surfaces;

means concentrically interconnecting the two pairs of relatively movable surfaces for allowing controlled horizontal translation of the movable mass while maintaining the normally vertical axis thereof substantially vertical and for allowing pivotal movement of the movable mass about the center of the spherical surface as a node; and

means for resiliently biasing the spherical surface coupled with the movable mass for maintaining the two pairs of relatively movable surfaces normally concentric and coaxial with respect to one another including a first set of tension springs secured on one end to the spherical surface coupled with the movable mass and on the other end to the interconnecting means and a second set of

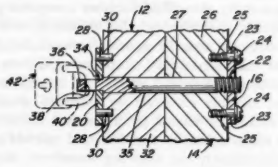
tension springs secured on one end to the juncture of the first set of springs with the interconnecting means and on the other end to the washing machine base, said first and second sets of tension springs being equally spaced and at least at three points around the periphery of the spherical surfaces, and for maintaining the vertical axis of the movable mass in a normally substantially vertical position, the resiliently biasing means also serving as a means for varying damping of vibration induced by rotation and oscillation of the movable mass.

3,922,893

SLIDING DOOR LOCKING DEVICE

Harold Roy Berg, 82 Plus 4 Pemberton St., Revere, Mass. 02151

Filed Sept. 17, 1974, Ser. No. 506,900
Int. Cl.² E05B *65/48*
U.S. Cl. 70—13 **8 Claims**



1. A sliding door locking device, comprising, in combination:

a. a latch plate;

b. a bolt member arrangeable in aligned apertures in sliding doors to be locked for engaging the latch plate, the latter arranged adjacent one of the doors; and

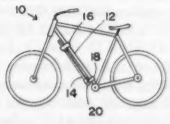
c. a keeper plate arrangeable adjacent the other of the doors for restraining the bolt member and maintaining same in engagement with the latch plate, the latch plate being provided with a threaded hole, and the bolt member being a headed, threaded bolt which threadingly engages in the threaded hole of the latch plate, the latter being mounted on the one of the doors with the threaded hole being aligned with the one of the apertures associated with the one of the doors, the keeper plate being provided with at least one pin selectively arrangeable in a recess provided in the other of the doors, and with a slot arranged for receiving the head of a bolt.

3,922,894

STORABLE CABLE LOCK

Robert W. Johnson, 5409 Fremont Ave., Minneapolis, Minn. 55430

Filed July 26, 1974, Ser. No. 492,177
Int. Cl.² E05B *73/00*
U.S. Cl. 70—18 **5 Claims**



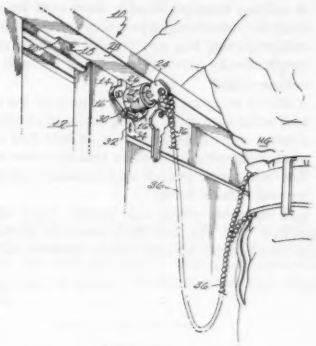
1. A storable cable lock comprising bracket means adatped to mount to an object to be secured with pivotable chain anchoring means pivoted on said bracket means, said anchoring means connected to a flexible chain which chain is constructed from a plurality of tubes and cables connected together in an end to end relationship in such a way that the cables can slide into said tubes so as to provide a compact storage unit.

3,922,895

SHOWCASE SECURITY SYSTEM

Howard M. Greenebaum, Pasadena, Md., assignor to Chain-Lock Co., Inc., Baltimore, Md.

Filed Feb. 6, 1974, Ser. No. 440,276
Int. Cl.² F05B *65/00*
U.S. Cl. 70—100 **2 Claims**



1. For a showcase including a case portion having a door slides open and closed, a showcase security system, comprising:

a lock housing mounted on said door adjacent one side edge thereof;

a bar bolt slidably mounted on said housing for sliding toward and away from the case portion;

a key operable tumbler cylinder coupled to the bar bolt for thrusting and retracting the bar bolt toward and away from the case portion;

key means removably insertable into the tumbler cylinder for operating the tumbler cylinder;

the tumbler cylinder permitting removal of the key when the key is in a predetermined angular alignment with the lock housing corresponding to the bar bolt being in a thrust condition;

a bolt catch provided on the case portion, where it is in alignment with the bar bolt only when the door is slid fully shut;

boss means on said housing and positioned to be engaged by the bar bolt, upon retraction thereof, upon rotation of the key in a sense to retract the bar bolt, by less than an angular amount such as will again bring the key to said predetermined angular alignment, whereby the key is prevented from being withdrawn unless the door is closed and the showcase is locked.

3,922,896

DOOR LOCKING DEVICE

Tetsuro Kagoura, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 19, 1975, Ser. No. 550,961
Claims priority, application Japan, Feb. 20, 1974, 49-21316[U]
Int. Cl.² E05B *13/10, 55/10, 63/18*
U.S. Cl. 70—223 **4 Claims**

1. In a door locking device, the combination of:

a. an inside and an outside knob rotatably supported on the inside and the outside, respectively, of a door, said inside and outside knobs having respective axes which are aligned with each other;

b. an actuator rod extending along said aligned axes of said inside and outside knobs, said actuator rod being rotat-

able simultaneously with at least said inside knob and being movable longitudinally between a first and a second position relative to said inside and outside knobs;

c. a push button arranged at one end of said actuator rod and projecting out of said inside knob, said push button being depressible to move said actuator rod from said first to said second position;

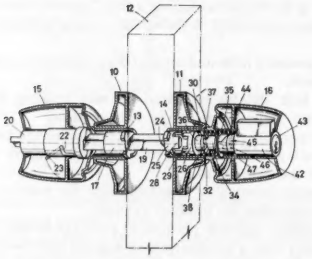
d. means for releasably holding said push button in a depressed position and hence for retaining said actuator rod in said second position;

e. a first clutch including:

1. a driving member fixedly supported by said outside knob for simultaneous rotation therewith, said actuator rod projecting into said outside knob by rotatably and longitudinally movably extending through said driving member; and

2. a driven member fixedly mounted on the other end of said actuator rod projecting into said outside knob, said driving and driven members of said first clutch being interengageable only when said actuator rod is in said first position to permit said actuator rod to be rotated by said outside knob;

f. a lock assembly within said outside knob adapted to be operated by a key, said lock assembly including a rotor rotatable relative to said outside knob by said key;



g. a slide within said outside knob constrained to linear movement between a third and a fourth position along said axis of said outside knob relative to the same, said slide being rotatable simultaneously with said outside knob;

h. spring means biasing said slide from said third toward said fourth position;

i. cam means within said outside knob effective to permit said slide to be moved from said third to said fourth position by said spring means when said rotor is rotated in a predetermined direction by said key, said cam means being also effective to move said slide from said fourth to said third position against the bias of said spring means when said rotor is rotated in the opposite direction to said predetermined direction by said key; and

j. a second clutch including:

1. a driving member fixedly mounted on said slide for simultaneous rotation therewith; and

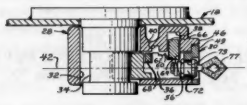
2. a driven member formed at said other end of said actuator rod, said driving and driven members of said second clutch being interengageable only when said actuator rod is in said second position and said slide in said fourth position to permit said actuator rod to be rotated by said outside knob.

3,922,897

SEMITRAILER KING PIN SECURING DEVICE

Thorwald J. Mickelson, 5550 Shorewood Lane, Excelsior, Minn. 55331

Filed Dec. 5, 1974, Ser. No. 529,797
Int. Cl.² B60R *25/00*; F16B *41/00*
U.S. Cl. 70—232 **9 Claims**



1. A locking mechanism adapted for being releasably secured to a generally elongated member comprising a member have an opening therethrough for receiving said elongated member, a cut-out area in open communication with said opening, first and second pair of spaced notch means formed in said member and disposed above said cut-out area, a movable element slidably received by said cut-out area having spaced leg members joined by a contact member with an engagement surface, and first and second pairs of spaced slots formed intermediately on said leg members, said movable member being longitudinally movable within said member between an outward unlocked position and an inward locked position whereby, whenever in the locked position said engagement surface interlocks with said elongated member received within said opening and whenever in the unlocked position said engagement surface is out of interlocking relationship with said elongated member, a tumbler normally received within said first notch means for vertical movement relative thereto for selective interlocking engagement with said first pair of slots when said movable element is in the locked position, a gravity responsive locking detent means normally received within said second pair of slots for vertical movement relative thereto and into said second notch means whenever said locking mechanism is in an inverted position and said movable element is in the unlocked position thereby preventing said movable element from moving to the locked position, whereby an operator is automatically alerted to an improper locking mechanism position, and a locking device connected to said movable element being selectively operable for vertically raising said tumbler from said first pair of slots and out of interlocking engagement therewith, thereby permitting movement of said movable member to the unlocked position.

3,922,898

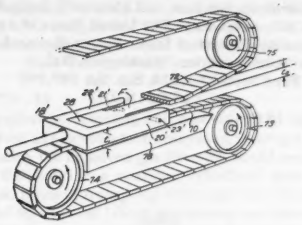
EXTRUSION PROCESS

William G. Voorhes, East Greenwich, R.I., assignor to Wanskuck Company, Providence, R.I.

Continuation-in-part of Ser. No. 456,354, March 29, 1974, abandoned. This application Mar. 20, 1975, Ser. No. 560,182
Int. Cl.² B21C *33/00*
U.S. Cl. 72—43 **6 Claims**

1. A process of continuously forming feedstock comprising the steps of providing a gripping means, gripping two opposed sides of feedstock material whereby the two opposing sides of the material are compressed to a pressure greater than the yield strength of the material, lubricating the ungripped surfaces of the feedstock, providing a fork-shaped element having opposed constraining walls, locating a die means in the vicinity of the base of the fork, moving the feedstock toward the die means by the gripping means, maintaining the gripping force greater than the yield strength of the material throughout the fork-shaped element, whereby as the feedstock is urged against the base of the fork the feedstock upsets against

the constraining wall surfaces and passes out through the die means, the gripping means advancing the feedstock into the



fork, said gripping means and constraining wall surfaces of said fork forming a passageway.

3,922,899

METHOD OF FORMING SANDWICH MATERIALS

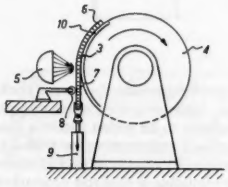
Maurice, Henri, Louis Fremont, Massy; Jean-Francois Denis, Lesigny, and Serve, Yvan Dzalba-Lyndis, Villejuif, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed July 8, 1974, Ser. No. 486,428

Claims priority, application France, July 10, 1973, 73.25292

Int. Cl.² B21D *47/00*

U.S. Cl. 72—128 **4 Claims**



1. A method of forming a metallic panel sandwich comprising two thin metal sheets maintained in mutually spaced relationship by a spacer element of honeycomb structure, corrugated elements, or the like, wherein the said method includes:

a. placing one sheet of a metallic panel sandwich against a rotating former of rounded surface;

b. applying radiant heat to the immediate proximity of points where said metallic panel sandwich is tangential to said rotating former whereby a localized and differential heating effect is provided in the two thin sheets passing thereby; and

c. simultaneously rotating said former to thereby effect formation of said metallic panel sandwich.

3,922,900

METHOD OF AND APPARATUS FOR ROLLING UNSYMMETRICAL SHAPE ELEMENT HAVING THE FLANGE

Kanichi Kishikawa, and Koe Nakajima, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 431,604, Jan. 8, 1974, abandoned. This application Apr. 2, 1975, Ser. No. 564,630

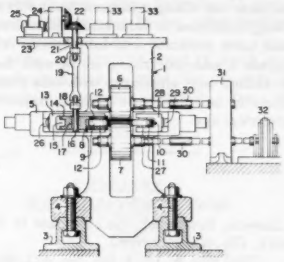
Claims priority, application Japan, Jan. 12, 1973, 48-6353; Jan. 12, 1973, 48-6354

Int. Cl.² B21B *13/10*

U.S. Cl. 72—225 **4 Claims**

1. In a method of rolling an unsymmetrical material having at least one flange through a rolling operation performed on the material, including the steps of roughing rolling, intermediate rolling, and finishing rolling the material, the finishing rolling step being performed by a pair of horizontal and a pair of vertical rollers, at least one of said vertical rolls contacting said at least one flange, the improvement which comprises:

aligning the axes of the vertical rolls to intersect the axes of the horizontal rolls; and



shaping the material by driving only the vertical roller contacting the flange by a driving means, when one flange is provided, and driving only the vertical roll contacting the flange portion of greater thickness when two flanges are provided.

3,922,901

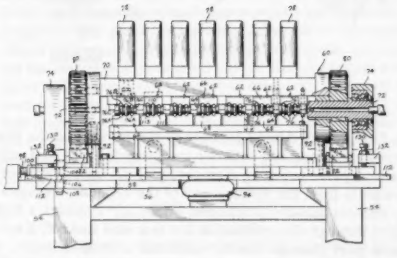
APPARATUS FOR BENDING TUBING

Danny H. Hillegas, Stevensville; Douglas D. Miller, Galien, and John F. Varga, Harbert, all of Mich., assignors to Weldun Tool & Engineering Co., Bridgman, Mich.

Filed Nov. 29, 1973, Ser. No. 420,304

Int. Cl.² B21D *7/02*; B21F *1/00*

U.S. Cl. 72—298 **5 Claims**



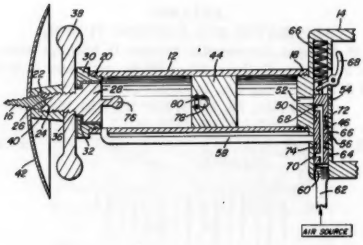
1. Apparatus for bending lengths of tubular material, said apparatus comprising a frame, a table supported upon said frame for lateral movement relative to said frame and to the path of endwise advancement of said tubular material into said apparatus, a bend head carried by said table and including a component thereof pivotal relative to the table about a horizontal pivot axis extending transversely to said path of material advancement, said bend head including a plurality of bend stations located side by side and extending across said table, each bend station including a bend block and a clamp block and a drag block, the bend and clamp blocks of said bend stations forming a part of said bend head component, each of said bend station blocks having at least two tube conforming grooves therein paralleling said path of material advancement, for each bend station the clamp block thereof is located at one end of the drag block and under the bend block wherein each groove in the clamp block is in an opposed relationship with a groove in the bend block and is aligned with a groove in the drag block, means for shifting said clamp block of each station relative to the bend block thereof to clamp said material between the bend and clamp blocks within a selected pair of

said opposed grooves, each pair of opposed clamp and bend block grooves and aligned drag block groove in a bend station constituting a groove set and being sized to accommodate tubular material having a specific outer diameter, means for pivoting said bend head component about its pivot axis with said tubular material clamped between the clamp and bend blocks of each bend station within a selected groove set thereof to cause the clamp and bend blocks to be positioned over the drag block and to bend said material, and means for shifting said table vertically and horizontally relative to said frame wherein a selected groove set of each bend station is unitarially shifted into alignment with said path of material advancement to accommodate tubular material of a given outer diametrical size.

3,922,902
DENT REMOVAL DEVICE

Davis R. Jarman, Brunswick, Ga., assignor to Virgil Hinson, Brunswick, Ga., a part interest

Filed Dec. 6, 1973, Ser. No. 422,187
Int. Cl.[2] B21D 1/12
U.S. Cl. 72—453 4 Claims

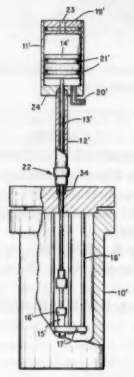


1. A fluid actuated hand tool for dent removal and the like comprising an elongated cylinder including forward and rear ends, a workpiece engaging element mounted on and projecting forwardly from the forward end of the cylinder, a longitudinally slidable hammer positioned within said cylinder, a first fluid port through the cylinder at the rear end thereof, a second fluid port through the forward end of said cylinder, a source of pressurized fluid, valve means selectively communicating the source of pressurized fluid with said first fluid port for a forward positioning of said hammer within the cylinder and with said second fluid port for a rearward driving of said hammer, abutment means at the rear of said cylinder receiving the impact of the rearwardly driven hammer, and lock means at the forward end of the cylinder for automatically engaging and releasably securing said hammer upon a forward positioning of the hammer, said second fluid port being located forward of said lock means with release of said lock means being effected in response to communication of the source of pressurized fluid with the second fluid port and a small buildup of pressure forward of the hammer, said workpiece engaging element comprising a threaded member for rotational driving into a workpiece aperture, and means for rotatably driving said threaded member independently of the remainder of the tool, the means for rotatably driving said threaded member comprising mounting means rotatably locking the threaded member to the forward end of the cylinder for rotation of the threaded member relative to the cylinder, and an enlarged handwheel locked to the mounting means for a rotational manipulation thereof.

3,922,903
HIGH TEMPERATURE AQUEOUS STRESS CORROSION TESTING DEVICE

Arthur N. Bornstein, San Jose, and Maurice E. Indig, Fremont, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 27, 1974, Ser. No. 509,990
Int. Cl.[2] G01N 3/18
U.S. Cl. 73—15.6 1 Claim



1. A device for stressing tensile specimens contained within a high temperature, high pressure system comprising: means for securing a specimen to be tested within a pressure vessel, means for connecting a specimen to be tested to a pressure actuated means located externally of said pressure vessel, said connecting means including a pull rod connected at one end thereof to means for gripping a specimen to be tested and at the opposite end to said pressure actuated means, said pressure actuated means comprising a piston accumulator having a piston movable therein and secured to said pull rod and having means for directing fluid pressure to said piston for moving same thereby stressing a specimen to be tested, and means mounted with respect to said connecting means external of each said pressure vessel and said pressure actuated means for preventing hydraulic and thermal interaction between pressure and temperature within said pressure vessel and said pressure actuated means comprising a fitting-seal assembly secured intermediate said pressure vessel and said pressure actuated means, said pull rod extending through said fitting-seal assembly, said fitting-seal assembly including a Teflon seal positioned about said pull rod preventing leakage of fluid therethrough while allowing free movement of said pull rod, said fitting-seal assembly additionally including a fitting having a body member defining a passageway therethrough for passage of said pull rod with said passageway having an enlarged end section defining a cavity, and a cap member removably secured to said body member and having an aperture therein through which said pull rod passes, said Teflon seal being located within said cavity of said body member, said fitting also including a thrust collar fixedly secured to said cap member and positioned in said cavity of said body member about said pull rod and adjacent said Teflon seal, said body member additionally including a threaded end portion secured in a threaded opening in said pressure vessel, and said cap member being provided with a nipple aligned with said aperture therein and having a threaded end portion removably secured to a nipple-like member surrounding said pull rod and secured to said pressure actuated means.

3,922,904
METHOD AND APPARATUS FOR DETECTING DISSOLVED GASES IN LIQUIDS

Dale D. Williams, Mc Lean, Va., and Roman R. Miller, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

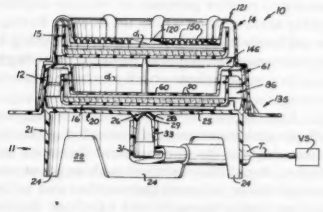
Filed Oct. 2, 1962, Ser. No. 227,959
Int. Cl.² G01N *7/00*
U.S. Cl. 73—19 **8 Claims**

1. A method of detecting and measuring the quantity of a gas dissolved in a liquid which comprises, flowing a carrier gas for displacing the dissolved gas from the liquid over a flowing body of the liquid in a confined cylindrical zone at carrier gs-to-liquid ratios of from 10 to 1 through 1 to 2 and flow rates therefor of up to about 100 cc per minute, continuously lifting films of the liquid into and across the flowing carrier gas to effect displacement of the dissolved gas from the liquid and formation of a mixture of the carrier gas and displaced dissolved gas and flowing said mixed gas through an operating thermal conductivity cell to relate the thermal conductivity of said mixed gas to that of the carrier gas.

3,922,905
DISPOSABLE SAMPLER

Thomas P. Roth, 5025 Hillsboro Road, Apt. 9E, Nashville, Tenn. 32715

Filed May 13, 1974, Ser. No. 469,325
Int. Cl.² G01N *5/04, 15/02*
U.S. Cl. 73—28 **12 Claims**



1. A disposable multi-stage sampling device for separating particles from a gaseous medium by jet impaction comprising:

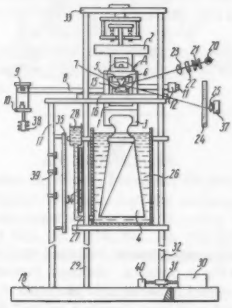
a plurality of stages serially connected to define a sealed passage between said stages for the passage of the gaseous medium between stages, each of said stages defining a plurality of jet impaction passages therein through which the gaseous medium passes, each of said stages including a collection member operatively associated with said jet impaction passages of said stage to cause certain size particles in the gaseous medium to be impacted onto said collection member as the gaseous medium passes through said jet impaction passages; and

frangible means operatively connecting said stages together, said frangible means constructed and arranged to be destroyed as an incident to the separation of said stages to prevent reassembly thereof, said frangible means including first locking means and second locking means adapted to engage each other to maintain said stages in a sealed relation with each other, said frangible means further including a frangible member connecting said first locking means to one of said stages so that said frangible member prevents disengagement of said first locking means from said second locking means without fracture of said frangible member to separate said first locking means from said one of said stages.

3,922,906
METHOD OF LOCATING THE CENTER OF GRAVITY ETC.

Nikolai Konstantinovich Snitko, ulitsa Tavricheskaya, 2, kv. 78; Nikolai Ivanovich Ryndin, ulitsa Chaikovskogo, 77, kv. 22; Alexei Alexeevich Yanson, ulitsa Parkhomenko, 37, kv. 80; Inna Ivanovna Vovk, Nevsky prospekt, 114, kv. 31; Samuil Noevich Shvarts, ulitsa Dybenko, 23 korpus 1, kv. 88, and Arseny Mikhailovich Pavlov, ulitsa Plekhanova, 44, kv. 27, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 352,303, April 18, 1973, abandoned. This application Mar. 1, 1974, Ser. No. 447,389
Claims priority, application U.S.S.R., Jan. 26, 1971, 1615561
Int. Cl.² G01M *1/12*
U.S. Cl. 73—65 **5 Claims**



1. A method of calculating the center of gravity of a homogeneous object, based on a known relationship in which the coordinates of the center of gravity in each given plane depends on the weight of said object and on the moment of said weight in said plane, comprising the steps of: balancing said object with respect to two orthogonal horizontal axes; immersing the inseparable measured part of said object into a fluid in order to locate the coordinates of the center of gravity of said part; measuring the buoyant force which appears as a result of said immersion step; and measuring the moment of said buoyant force in two given vertical orthogonal planes, whereby the sourght coordinates of the center of gravity of said part of said object may be calculated.

3,922,907
IN-BORE TURBINE INSPECTION DEVICE

Michael J. Hurwitz, Wilkinsburg, and James W. Wonn, Irwin, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 12, 1974, Ser. No. 478,808
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.7 **14 Claims**

1. A device for detecting cracks existing within the body of a test member, the member having an axis extending longitudinally therethrough, said device comprising:

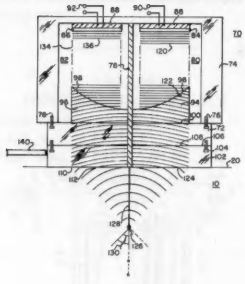
a base member having a casing attached thereon,

a partition dividing said casing into a transmit compartment and a receive compartment,

transducer means for producing high frequency acoustic energy, said transducer means including a transmit element for transmitting high frequency acoustic energy and a receive element for receiving high frequency acoustic energy, said transmit element being disposed within said transmit compartment within said casing, said receive element being disposed within said receive compartment within said casing, and,

focus means for focusing said high frequency acoustic energy produced by said transducer means at a focus within

said test member and in a plane containing said longitudinal axis, said focus means including a transmit lens element and a receive lens element, said transmit lens being mounted on said base member within said transmit compartment opposite said transmit element of said transducer means, said receive lens being mounted on said base member within said receive compartment opposite said receive element of said transducer means,



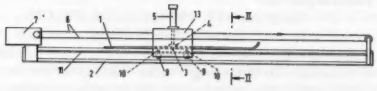
said transmit compartment and said receive compartment each having a material disposed therein, said material being disposed between said elements of said transducer means and said lens elements of said focus means disposed in said transmit compartment and said receive compartments, said material exhibiting a characteristic such that the speed at which said acoustic energy travels through said material is less than the speed at which said acoustic energy travels through said focus means and said base member.

3,922,908

METHOD AND APPARATUS FOR MEASURING AND RECORDING THE TENSION AND RIGIDITY OF A SKI UNDER STRESS

Finn Stemsrud, As; Reidar Otto Ullevålseter, Oslo, and Oystein Mengkrog, As, all of Norway, assignors to Norges Landbrukshogskole, As, Norway

Filed Aug. 5, 1974, Ser. No. 494,859
Int. Cl.² G01N *3/20*
U.S. Cl. 73—100 **5 Claims**



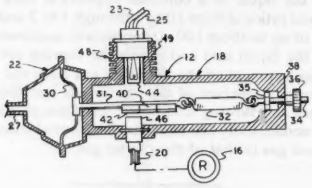
1. A method for determining and recording the tension and rigidity of a ski under stress, comprising applying pressure against a ski at the location where and in the direction that a skier's foot applies pressure to the ski thereby to depress the ski against a rigid base, measuring and recording the pressure exerted by the ski at one point on said base, moving said ski lengthwise of the ski while maintaining on the ski the same said pressure whereby the ski progressively passes and presses against said point, and recording various pressures exerted by said ski against said point as a curve on a graph one of whose coordinates corresponds to the length of the ski and the other of whose coordinates corresponds to pressure.

3,922,909

FUEL ECONOMY MONITORING SYSTEM FOR ENGINES OF VEHICLES

Bruce E. Dixson; John E. Gayton; Dennis J. Lowery, and William F. Burke, all of Grand Junction, Colo., assignors to Dixson, Inc., Grand Junction, Colo.

Filed Aug. 26, 1974, Ser. No. 500,400
Int. Cl.² G01M *15/00*
U.S. Cl. 73—115 **1 Claim**



1. A fuel economy monitoring system for engines, particularly of vehicles, to monitor intake manifold vacuum of a vehicle engine being subjected to speed and load changes to obtain the most economical fuel consumption rate in keeping with the operator or driver's operating objectives, comprising, in respect to a vehicle:

a. housing to contain many of the components and to be secured to the vehicle structure at any location;

b. an enclosed relative pressure or vacuum diaphragm sub-assembly secured to or within the housing having a movement indicator rod projecting into the housing for translating movement therein and having a receiving structure to receive a vacuum hose coming from an intake manifold of an engine;

c. a light filter sub-assembly within the housing secured to the diaphragm movement indicator rod of the diaphragm sub-assembly, for direct movement therewith and having multiple colored filter sections such as green, amber and red respectively, adjacent one another and in line, green indicating higher vacuum and excellent fuel economy, amber indicating lower vacuum and somewhat reasonable fuel economy, and red indicating little or no vacuum and poor fuel economy, and the transitional blended colors indicating the changeovers in status;

d. a light sub-assembly attached to the housing and positioned to shine light through a portion at a time of the light filter sub-assembly;

e. a light pickup sub-assembly to scan the lighted portion of the light filter sub-assembly, attached to the housing, having a fibre optic bundle sub-assembly extending from within and beyond the housing to convey the image of the scanned lighted portion of the light pickup sub-assembly to a remote location, as the extending end of the fibre optic bundle is secured to the vehicle within the peripheral field of vision of the vehicle operator, and

f. a calibration sub-assembly, comprising in turn:

a. an adjustment screw with an anti-rotation member mounted for translation through the end of the housing;

b. an adjustment nut threaded on the adjustment screw externally of the housing to regulate the translation movement of the adjustment screw; and

c. a coiled tension spring secured inside the housing between the end of the adjustment screw and the end of the diaphragm movement indicator rod, this calibration sub-assembly being utilized to match both a vehicle's engine general operating characteristics and in addition the driver's personal desires of engine fuel economy versus overall vehicle performance.

3,922,910

MEANS FOR DETERMINING THE RELATIVE SPEEDS OF THE INPUT AND OUTPUT SHAFTS OF A GEARBOX

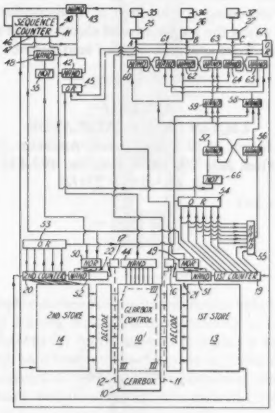
Harvey Frank Dickinson, Bramhall, England, assignor to Ferranti Limited, Hollinwood, England

Continuation-in-part of Ser. No. 312,730, Dec. 6, 1972, abandoned. This application May 21, 1974, Ser. No. 471,903

Claims priority, application United Kingdom, Dec. 7, 1971, 56661/71

Int. Cl.² G01M *13/02*

U.S. Cl. 73—118 **11 Claims**



1.

Means for determining the relative speeds of the input and output shafts of a gearbox comprising means having a first transducer and a second transducer arranged to produce signals representative of the rotational speeds of both the input shaft and the output shaft of the gearbox, compactor means including a first counter connected to the first transducer and a second counter connected to the second transducer, number generating means for setting magnitudes in the counters, the ratio of the magnitude set in the first counter to the magnitude set in the second counter being representative of the desired gear ratio for the gearbox, the magnitudes stores in the counters then being changed by signals from the transducer means, the arrangement being such that the comparator means provides an output representative of the proportion of any difference between the desired gear ratio and the ratio of the rotational speeds of the input and output shafts of the gearbox in relation to the desired gear ratio.

3,922,911

APPARATUS AND METHOD OF DETERMINING FLOW

Henry William Groves, London, and John Yarnell, St. Albans, both of England, assignors to Hawker Siddeley Dynamics Limited, England

Filed Nov. 27, 1972, Ser. No. 309,749

Claims priority, application United Kingdom, Dec. 9, 1971, 57168/71; Feb. 10, 1972, 6313/72; Apr. 28, 1972, 19820/72

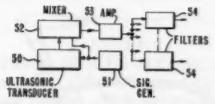
Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **17 Claims**

14. Apparatus for processing measurement signals obtained by the Doppler flow sensing technique, wherein said measurement signals are of different nominal frequencies from which the signals are shifted as a function of the instantaneous velocity of respective fluid particles in the sensed flow, said apparatus comprising:

clocking means for generating a train of pulses defining repetitive sequences of operating cycles of said apparatus;

a multiplexer controlled by said clocking means and arranged to receive a plurality of input signals to which individual members are assigned, each number corresponding to a respective operating cycle defined by said train of pulses, and to provide as a single output signal the



input signal having an assigned number corresponding to the current operative cycle defined by said train of pulses; and

means for applying said measurement signals of different nominal frequency to said multiplexer as said plurality of input signals.

3,922,912

ANEMOMETERS

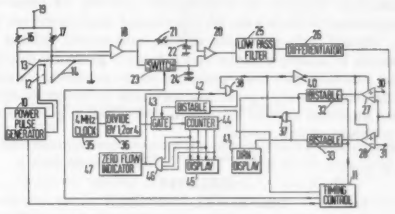
Leslie John Stanley Bradbury, Farnham, England, and Nicholas Liptay Wagner, Windsor, Canada, assignors to National Research Development Corporation, London, England

Filed Feb. 25, 1974, Ser. No. 445,549

Claims priority, application United Kingdom, Feb. 27, 1973, 9536/73

Int. Cl.² G01F *1/68*

U.S. Cl. 73—204 **15 Claims**



1. Apparatus for measuring the velocity of fluids, including electrical heating means for locally heating a flowing fluid for short intervals in response to current pulses passed through the heating means,

a temperature sensitive element for providing an electrical signal dependent on the temperature of the fluid, the temperature sensitive element being in operation positioned, at least partially, in the path of heated fluid from the heating means,

means for detecting changes in the said electrical signal,

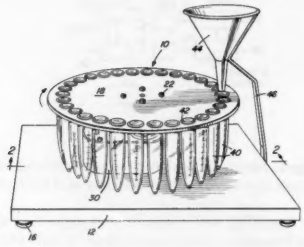
timing means for providing an indication of the duration of the intervals between each current pulse and each consequent change in the said electrical signal, and

an inhibit circuit comprising means for combining, in opposition, signals along two substantially electrically equivalent paths each of which is coupled to receive the said electrical signal, one of the said paths including switch means having continuity means for providing continuity in the said one path and control means for controlling the continuity means to provide continuity when each of the current pulses occurs for an interval which terminates before the heated fluid is expected to reach the temperature sensitive element, the means for combining signals being coupled to pass its output signal to the means for detecting changes.

3,922,913
FLOWMETER

Norman D. Scott, Route 2, Box 409, Daytona Beach, Fla. 32019

Filed Apr. 10, 1974, Ser. No. 459,902
Int. Cl.² G01F 3/24
U.S. Cl. 73—219 6 Claims

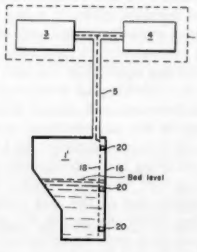


1. A flowmeter for measuring the rate of urine discharge during discrete increments of a urine elimination cycle of approximately 21 seconds by measuring the quantity of urine discharged during each such increment and providing a separate specimen for each such increment for analysis comprising a turntable, means rotatably supporting said turntable for rotation about a vertical axis, means driving said turntable at a predetermined constant slow speed whereby the turntable will turn less than one revolution during a complete cycle of urine elimination, a plurality of receptacles carried by said turntable circumferentially about the center of rotation, and urine guide means disposed above the receptacles for discharging urine into the receptacle, each receptacle having graduations thereon to indicate the quantity of urine discharged therein during the predetermined time increment that it is aligned with the guide means, said means driving the turntable including a motor and reduction gear unit disposed under said turntable and connected to the turntable for rotating the turntable at 2 r.p.m., said turntable including 30 receptacles mounted thereon for alignment with the guide means for a period of one second.

3,922,914
BED LEVEL MONITOR

Walter Fuchs, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sept. 18, 1974, Ser. No. 507,099
Int. Cl.² G01F 23/28
U.S. Cl. 73—290 R 2 Claims



1. A system for sensing the fluid level of a fluid bed reactor, said reactor including a reactor vessel in which the fluid bed is contained comprising an electrically conducting wall of an irregular shape including at least one substantially straight, vertical side wall, said system comprising:

an elongate electrode which is mounted within said vessel in contact with the fluid therein, and which cooperates with the wall of said vessel to form an electrical transmission line,

means for applying electrical pulses to one end of said electrode so that an applied pulse is reflected at various levels of the fluid within the vessel,

means for measuring the time period between an applied pulse and a reflected pulse,

and means for mounting said electrode in close proximity to the substantially straight side wall of the vessel along the length thereof so as to concentrate the electric field between the electrode and the said side wall, said mounting means including a plurality of non-conduting spacers located along the length of said electrode for spacing said electrode from said side wall of said vessel.

3,922,915
LIQUID LEVEL INDICATOR

Ottie H. Andrews, 3129 Olinda Lane, Anaheim, Calif. 92804

Filed July 29, 1974, Ser. No. 492,439
Int. Cl.² G01F 23/14
U.S. Cl. 73—302 9 Claims

1. An apparatus for indicating an accurate level of liquid disposed within a tank, said tank being of the type for storage of liquid fuel and adapted to be mounted to a motor vehicle, wherein said apparatus comprises:

a bell housing being in operable communicating relationship with the interior of said tank;

a pressure chamber defined by said bell housing;

a pressure-control means positioned adjacent the lower end of said bell housing, whereby air and liquid can pass between said chamber and said tank,

said pressure-control means including:

a first orifice;

a second orifice, said first orifice having a reduced diameter relative to that of said second orifice, and wherein said first orifice is positioned above said second orifice;

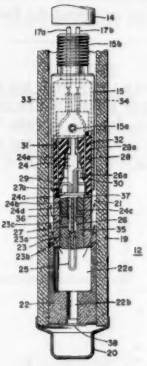
a pressure-gauge means operably interconnected to said pressure chamber, whereby a constant reading of the liquid contents of said tank can be obtained; and

a conduit system disposed between said pressure-gauge means and said pressure chamber, whereby said pressure-gauge means is remotely disposed with respect to said tank.

3,922,916
SAMPLER FOR MOLTEN MATERIALS

Charles J. Wickert, Willow Grove, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed July 15, 1974, Ser. No. 488,367
Int. Cl.[2] G01N 1/10
U.S. Cl. 73—354 14 Claims

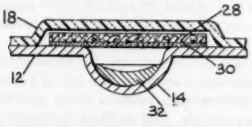


3. A sampler device for molten material said device including a body having wall structure defining a cavity and an entrance thereto for receiving and retaining a sample of molten material, said body supporting one or more sensing means having an electrical output the magnitude of which is a function of a characteristic of the molten material, said body being supported in an end of a tubular member, said body supporting electromechanical connector structure at an end thereof in said tubular member with electrical contacts thereof in electrical connection with said sensing means, the improvement comprising a vent passage between a portion of said body and said tubular member at the end of said body supporting said connector, means providing a passage for the flow of gas from said cavity to said vent passage, and means to seal the connector structure against the ingress of gases vented from said cavity.

3,922,917
DISPOSABLE THERMOMETER

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Aug. 31, 1973, Ser. No. 393,557
Int. Cl.[2] G01K 11/20, 11/08
U.S. Cl. 73—356 5 Claims

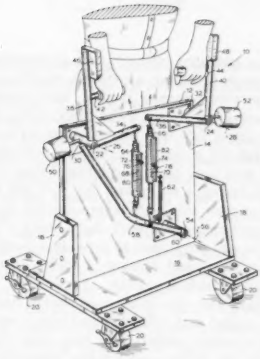


1. A disposable, irreversible, clinical thermometer comprising: a base member provided with at least one cup therein; a temperature sensitive material disposed within said cup, said material being meltable at a predetermined temperature; a covering member overlying said portions of the base member; said cup extending away from said covering member and being so dimensioned that when melted, the surface tension of the material is sufficient to maintain the material within the cup regardless of the orientation of the cup; dye means carried by said covering member and spaced apart from said material, said dye means being soluble in said material when in melted form; at least one of said members being deformable with respect to the other of said members whereby to enable said dye means to come into contact with said material; means to maintain said temperature sensitive material and dye means in spaced apart relationship until said one member is deformed; and, means adapted to indicate if said dye means goes into solution in said material in meltable form.

3,922,918
ORTHOPEDIC MUSCLE TESTING APPARATUS

Edward L. Farrar, Jr., 117 E. Copeland, Orlando, Fla. 32806

Filed Aug. 22, 1974, Ser. No. 499,472
Int. Cl.[2] G01L 5/02
U.S. Cl. 73—379 12 Claims



1. Muscle testing apparatus comprising:
a frame;
first means for measuring the strength of one muscle, having a first shaft rotatable about a first pivot axis, and first strain measuring means coupled to said shaft;
second means for measuring the strength of another muscle, having a second shaft rotatable about a second pivot axis, and second strain measuring means coupled to said second shaft;
means for operating said first and second means;
a pivotal lever coupled to said frame; and wherein
said first and second strain measuring means are coupled between said lever and said respective first and second shafts.

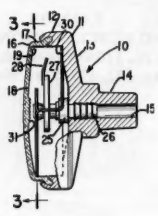
11. Muscle testing apparatus for simultaneously measuring the strength of different muscles, comprising:
a frame;
a first shaft rotatably pinned to said frame on a first pivot axis substantially normal to said frame;
a second shaft rotatably pinned to said frame on a second pivot axis substantially normal to said frame, said second pivot axis spaced from said first pivot axis;
a lever rotatably pinned to said frame on a third pivot axis substantially normal thereto, said third pivot axis spaced from said first and second pivot axes;
first strain measuring means coupled to said first shaft and said lever;
second strain measuring means coupled to said second shaft and lever; and
means for simultaneously rotating said first and second shafts in opposite directions to thereby effect a strain measurement on the corresponding one of said frame measuring means.

3,922,919

PRESSURE GAUGE

William Carl Schulze, Hatboro, and Ralph D. Waite, Sellersville, both of Pa., assignors to Ametek, Inc., New York, N.Y.

Continuation of Ser. No. 208,647, Dec. 16, 1971, abandoned.
This application Feb. 14, 1974, Ser. No. 442,469
Int. Cl.[2] G01L 7/04
U.S. Cl. 73—418 4 Claims



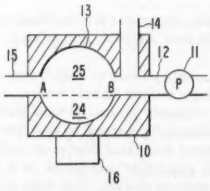
1. A pressure gauge for connection to an aluminum pressure vessel, said gauge including a pressure responsive indicator movement operably arranged therein, said gauge having an aluminum housing comprising a one-piece casing of aluminum having a cylindrical side wall connected at its inner end to a back plate, a tubular projection extending outwardly from the outer face of said back plate and integral therewith, a transparent window having a peripheral side wall and a front viewing face, said window side wall being mounted and held in the outer end of said casing side wall, there being a bore through said back plate and projection to provide a passage from the interior of the casing and window, a socket of a metal, said metal being one which is capable of corrosion when in galvanic association with aluminum, said socket having one end serrated and coated with adhesive and snugly and intimately received and retained within said bore and the other end projecting into the casing and window assembly, said metal being such that a Bourdon tube can be readily soldered thereto, and a Bourdon tube soldered to said socket, whereby the aluminum casing can be connected to an aluminum pressure vessel without corrosion occurring between the tubular projection and pressure vessel, the socket being exposed to the interior of the pressure vessel only through said bore.

3,922,920

FLUID SAMPLING DEVICE

Stephen Chandler, 10571 Magdalena, Los Altos, Calif. 94022

Filed June 11, 1973, Ser. No. 368,830
Int. Cl.[2] G01N 1/10
U.S. Cl. 73—422 TC 12 Claims



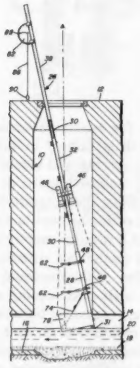
1. A fluid sampling apparatus comprising
a fluid sample holder comprising a body member defining a hollow chamber with inlet conduit means for communicating between said chamber and a fluid source;
an outlet conduit means for said chamber;
each of said inlet and outlet conduit means having the lowest portion thereof in the same horizontal plane when the sampling apparatus is positioned for taking a sample;
said inlet and outlet conduit means defining a fluid metering portion of said chamber below said horizontal plane, said body member providing continuous free air communication between said fluid metering portion, said inlet conduit means and said outlet conduit means whereby fluid passing through said inlet means flows through the fluid metering portion of said chamber to said outlet means, and
a conduit means communicating with said metering portion of said chamber for removing the fluid sample.

3,922,921

METHOD AND APPARATUS FOR MEASURING SEWER SEDIMENTATION INFILTRATION AND FLOW

Enrique Woo, 216 Vista Bonita, El Paso, Tex. 79912

Filed July 22, 1974, Ser. No. 490,868
Int. Cl.[2] G01F 23/06
U.S. Cl. 73—432 R 11 Claims



1. An elongated upstanding probe, an elongated tether member having one end portion attached to a lower portion of said probe at a point spaced a distance above the lower terminal end thereof less than the effective length of said tether member, a water buoyant float member anchored to the other end portion of said tether member, and vertically spaced sighting structures supported from said probe and spaced outwardly from one side of said probe, said sighting structures being spaced along a sight path at least generally paralleling said probe and into which said float will be floated when the lower terminal end of said probe is touched against the upper surface of a body of water flowing in a direction outwardly from said one side of said probe.

11. The method of determining the cross-sectional area of the fluid flow through a sewer or like line of a known diameter disposed an indeterminate distance below ground level at the lower end of a manhole, said method comprising the steps of lowering an upstanding probe down into said manhole until the lower end of the probe touches the surface of water in the bottom of the manhole and noting the elevation of the probe at the upper end of the manhole, further lowering the probe until the lower end thereof touches the sedimentation in the line and noting the elevation of the probe at the upper end of the manhole, and thereafter lowering the probe until the lower end thereof engages the bottom of the line and noting the elevation of the probe at the upper end of the manhole, and thereafter mathematically computing the effective cross-sectional area of the fluid flow through the line.

3,922,922

DEVICE FOR BALANCING UNBALANCED ROTORS IN WHICH THE ROTOR CAN SWING BETWEEN HORIZONTAL AND VERTICAL POSITIONS

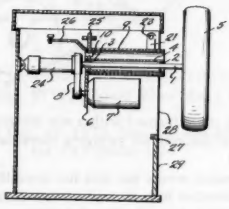
Eickhart Goebel, Pfungstadt, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Filed Apr. 29, 1974, Ser. No. 465,440

Claims priority, application Germany, Apr. 27, 1973, 2321437

Int. Cl.² G01M 1/22

U.S. Cl. 73—462 15 Claims



1. In an apparatus for balancing imbalanced rotors, having a rotatable shaft, the unbalance being determined and compensated in two planes, the improvement wherein said shaft is mounted for rotation in an inner housing, an outer housing supporting said inner housing, transducer means disposed between said housings for detecting the vibrations on said rotating shaft, means for swinging said shaft and housings between a horizontal and a vertical position and means mounted on said inner housing for rotating said shaft.

3,922,923

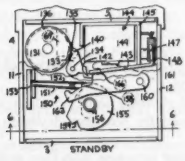
AUTOMATIC CONTROL OPERATING MECHANISM

John L. Harris, Clearwater, Fla., assignor to Deltrol Corporation, Bellwood, Ill.

Division of Ser. No. 321,715, Jan. 8, 1973, Pat. No. 3,833,818, which is a division of Ser. No. 179,422, Sept. 10, 1971, Pat. No. 3,745,273. This application Mar. 18, 1974, Ser. No. 451,896

Int. Cl.² F16H 5/74

U.S. Cl. 74—2 7 Claims



1. In a control mechanism, a control device, cam means arranged to operate said control device, an operator, means for supporting said operator and providing a limited range of movement therefore, said operator being arranged to operate said control device conjointly with the cam means, said cam means having two separate camming portions at different levels for operating the control device, the camming portion at one level being within the range of movement of the operator providing conjoint operation of the control device and the camming portion at the other level being beyond the range of movement of the operator to exclude operation of the control device by the operator.

3,922,924

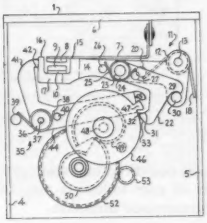
MANUAL PRESET TIMER

John L. Harris, Clearwater, Fla., assignor to Deltrol Corporation, Bellwood, Ill.

Filed Dec. 19, 1974, Ser. No. 534,222

Int. Cl.² G05G 17/00

U.S. Cl. 74—3.5 10 Claims



1. In a timing device, controller operating means movable through a predetermined stroke between a timing position and a timed-out position, timing means having a timed-out position and being movable in one direction from its timed-out position to a timing position, said timing means being constructed and arranged to run in the opposite direction back to its timed-out position, means including latch means for holding the operating means in timing position when the latch means is engaged and for returning the operating means to timed-out position when the latch means is disengaged, one way drive means between the timing means and operating means and arranged to move the operating means through a driven stroke from timed-out position to timing position for engagement of the latch means as said timing means is moved in said one direction from its timed-out position, said one way drive means including a pawl bodily carried by one of said two first mentioned means and engaging the other, said pawl and its engaging means being constructed and arranged to provide a component of force holding the pawl in driving position while the operating means is being moved through its driven stroke and to reduce said component of force at the end of said driven stroke so that the pawl is ineffective to hold the operating means in timing position, and means actuated by the timing means on reaching its timed-out position for releasing the latch means.

3,922,925

DEVICES FOR CONTROLLING OPENING AND CLOSING OF PRESSURE DOORS AND PRESSURE DOOR EQUIPMENTS INCORPORATING SAID CONTROL DEVICES

Kiyomi Takei; Katsumi Takahashi, and Kazuo Kanazawa, all of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,049

Int. Cl.² F16H 25/08; E05C 9/12, 9/14

U.S. Cl. 74—53 4 Claims

1. A device for controlling a plurality of operation steps in a predetermined sequential order comprising;

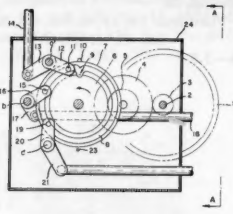
a. a handlewheel,

b. a cam disk operatively coupled to said handlewheel through reduction gear means and provided with a cam surface having one cam follower displacing protion,

c. a plurality of cam followers located around said cam disk and spaced apart from each other by a predetermined distance in such a way that said plurality of cam followers may be displaced sequentially in a predetermined order as said cam disk is rotated by said handlewheel in one direction through a predetermined angle, and

d. lever means operatively coupling each of said plurality of cam followers to an operating rod,

whereby when said plurality of cam followers engage with said cam follower displacing portion of said cam disk as said cam



disk rotates in said one direction, said operating rods coupled to said plurality of cam followers may be sequentially displaced in a predetermined direction.

3,922,926

STEPPING DRIVE

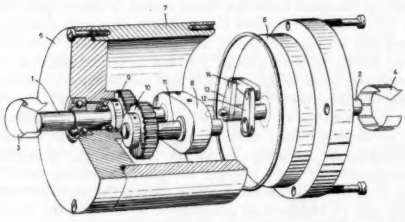
Herbert Bernardi, Munich, Germany, assignor to G.A.O. Gesellschaft fur Automation und Organisation m.b.H., Germany

Filed Apr. 12, 1974, Ser. No. 460,452

Claims priority, application Austria, Apr. 13, 1973, 3312/73

Int. Cl.[2] F16H *21/12*

U.S. Cl. 74—63 **7 Claims**



1. A stepping drive for high step frequencies which, at constant input angular velocity, generates a sinelike response of the output angular velocity, i.e., permits, for example, one or more stops of the output shaft per revolution of the input shaft, characterized in that a crank motion is superimposed on a uniform rotary motion, so that the desired sine-like output angular velocity is obtained.

3,922,927

TENSIONER FOR A BELT TRANSMISSION

Kazuhiro Shiki, and Masaru Hibino, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 16, 1974, Ser. No. 498,096

Claims priority, application Japan, Jan. 17, 1974, 49-8393[U]

Int. Cl.[2] F16H *7/10*

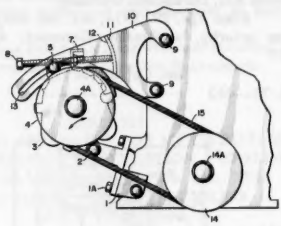
U.S. Cl. 74—242.13 R **5 Claims**

1. A tensioner for a belt transmission supporting an accessory which is adjunct to the engine of an automobile and equipped with a driven pulley connected via belting to a drive pulley of the engine, at a fulcrum spaced from the rotational center of the driven pulley, in such a manner that the accessory can be swung and shifted in angular position relative to the fulcrum, the tensioner comprising:

a threaded hole part secured to said accessory;

an adjusting bolt in threadable engagement with said hole part and projecting beyond the latter;

a tension-bearing wall adapted to receive the projecting end of said adjusting bolt in contact at substantially right angles thereto so as to bear the tension of the belt transmitted through said adjusting bolt;



an adjusting plate formed with a slot arcuately shaped relative to said fulcrum for swinging movement of said accessory; and

a bolt extended across the slot for threadable engagement with a threaded hole in said accessory and for fastening said accessory to said adjusting plate.

3,922,928

STEERING COLUMN FOR A MOTORVEHICLE

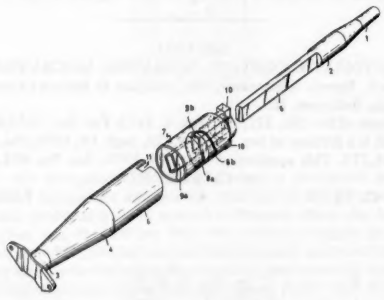
Wilhelmus Leonardus Maria Kester, Eersel, Netherlands, assignor to Van Doorne's Personenautofabriek Daf B.V., Eindhoven, Netherlands

Filed June 7, 1974, Ser. No. 477,501

Claims priority, application Netherlands, July 12, 1973, 7309715

Int. Cl.[2] R62D *1/16*

U.S. Cl. 74—492 **3 Claims**



1. A steering column for a motor vehicle, said steering column comprising:

first and second steering shaft portions, said first shaft portion being partially positioned within said second shaft portion; and

means, positioned between said first and second shaft portions, for transmitting rotation of one of said shaft portions to the other of said shaft portions and for allowing axial movement of one of said shaft portions with respect to the other of said shaft portions, said means comprising: first and second tubular members each fixed to an elastic element fixedly positioned within said second shaft portion, said first and second tubular members being axially positioned one behind the other within said second shaft portion, said first shaft portion extending through said first and second tubular members;

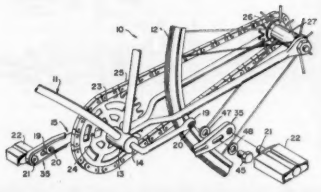
said first and second tubular members each having means on the internal surfaces thereof cooperating with means on the external surface of said first shaft portion for allowing relative axial movement between said first

shaft portion and said first and second tubular members and for preventing relative rotation therebetween; and said first and second tubular members being circumferentially positioned such that said means on said internal surfaces therof are circumferentially offset with respect to each other when said first shaft portion is not assembled therein, thereby providing means for exerting torsional pressure on said first shaft portion when said first shaft portion is assembled in said first and second tubular members and for thus retarding axial movement between said first shaft portion and said first and second tubular members.

3,922,929
BICYCLE PEDAL CRANK EXTENDER

John L. Marchello, 57751 Grand River Ave., New Hudson, Mich. 48165

Filed Dec. 12, 1973, Ser. No. 426,685
Int. Cl.² G05G 1/14
U.S. Cl. 74—562 **5 Claims**



1. An extender for removable attachment to the lower end of and for adjustably extending the length of a conventional bicycle pedal crank having a shaft portion terminating in an end portion having an opening for receiving and mounting a conventional bicycle pedal mounting stud, comprising:

an elongated, stamped metal channel formed to include a base and integral legs and having an upper end and a lower end, said upper end receiving the crank shaft, and the channel being of a size to receive said crank shaft portion and end portion, with the portions of the legs at the extender upper end converging toward each other and being spaced apart a sufficient distance to resiliently frictionally grip the shaft portion between them, and said base being longitudinally slit at its upper end in the region where the legs converge and grip the shaft to permit resilient movement of the converging leg portions for receiving and gripping the shaft;

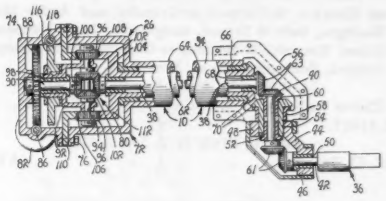
a longitudinally elongated slot formed in said base for overlapping the crank end portion opening, and for receiving a bolt engaged with said end portion opening for thereby fastening the crank to the extender, wherein the extender may be adjusted lengthwise of the crank within the limits of the length of said slot;

and a threaded socket rigidly connected to the lower end of the extender for receiving and securing said pedal mounting stud for thereby mounting a bicycle pedal upon the extender rather than upon the crank directly, said socket having a thickness several times greater than the thickness of the stamped metal channel base.

3,922,930
REMOTELY OPERABLE ARTICULATED MANIPULATOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Ray E. Marlow, Wellsboro, Pa.

Filed Dec. 23, 1974, Ser. No. 535,410
Int. Cl.² F16H 37/06, 35/00; B25J 3/00
U.S. Cl. 74—665 B **8 Claims**



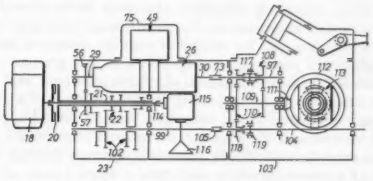
1. In a remotely operable, articulated manipulator including a plurality of serially connected drive shafts and a grasping device mounted at the distal end of the ultimate drive shaft of said plurality, the improvement comprising:

drive means for selectively imparting to said grasping device angular displacement about a pair of normally related axes, one of which comprises a projection of the longitudinal axis of said ultimate drive shaft.

3,922,931
SPEED CHANGE DEVICE FOR TRACTOR TRANSMISSIONS

Masahide Osujyo, Sakai; Naoya Tuda, Fujiidera, and Yoshimi Ota, Sakai, all of Japan, assignors to Kubota Tekko Kabushiki Kaisha, Japan

Filed Jan. 4, 1974, Ser. No. 430,717
Int. Cl.² F16H 3/02, 47/04, 37/00, 37/06
U.S. Cl. 74—745 **11 Claims**



1. A transmission comprising the three systems of an input system including a main input shaft operable to transmit power when a clutch is engaged and provided with a plurality of gears; a driving speed change system comprising a hydraulic pump and a hydraulic motor hydraulically connected to the hydraulic pump, the hydraulic pump including a pump gear meshing with one of the gears of the input system; and a power takeoff speed change system including a power takeoff speed change shaft having a suitable number of gears meshable with the gears of the input system; the driving speed change systme and the power takeoff speed change system being supported in parallel to each other in the input system interposed therebetween, characterized by a hydraulic transmission unit comprising a capacity-variable hydraulic pump unit including a pump shaft and a hydraulic motor unit of constant capacity including a motor shaft, the pump shaft being fixedly provided with a pump gear meshing with the gear of the input system, the pump shaft and the motor shaft being coaxially aligned with each other, a center section being provided between and held by the units in a readily detachable manner and incorporating a charge pump mounted on the pump shaft, the pump unit, charge pump and motor unit being arranged in series, the

hydraulic transmission unit serving as the driving speed change system and being housed in a transmission case and thereby supported removably, the transmission further being characterized by a valve unit removably mounted on the center section of the hydraulic transmission unit.

3,922,932
CRENELLATION DRUM; AND EPICYCLIC TRANSMISSION INCORPORATING THE SAME

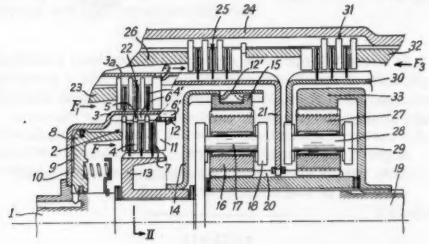
Jean Maurice, St-Germain-la-Granche, and Andre Mouttet, Boulogne, both of France, assignors to Regie Nationale des Usines Renault, St-German-la-Granche and Automobiles Peugeot, Boulogne, both of, France

Filed Nov. 21, 1973, Ser. No. 417,902

Claims priority, application France, Nov. 24, 1972, 72.41917

Int. Cl.² F16H *1/32, 55/12, 57/08*

U.S. Cl. 74—763 **4 Claims**



1. An epicyclic transmission including a ring gear having a toothed inner face and a splined outer face, a sun gear coaxially within said ring gear; a plurality of planet gears in nesting contact with and between said sun gear and said ring gear; a crenellated drum whose crenellations define grooves to receive the splined outer face of said ring gear; two sets of abutment members formed on said crenellated drum, each set of abutment members being arranged on a respective plane transverse to the drum axis and the abutment member of the sets being oppositely disposed, abutment faces of said ring gear arranged in respective abutment planes transverse to the axis of said ring gear for abutment with the abutment faces of said abutment members; and apertures in said grooves of the crenellated drum adjacent said abutment members, said abutment members each comprising an upset portion of a groove of said crenellated drum, said upset portion having a profile when viewed as a cross-section on an axial plane of the drum which extends continuously from said aperture through a first zone of a given curvature and then a second zone of a reversely directed curvature to merge with the groove of the crenellated drum, said aperture having a smaller extent than the upset portion when viewed as a development of the drum, and the abutment edge being at the edge of said abutment member closest to said aperture and shaped to lie in the respective abutment plane.

3,922,933
CONTROLS FOR AUTOMATIC TRANSMISSIONS

Toshimitsu Sakai, and Mitsuo Kawai, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Feb. 25, 1974, Ser. No. 445,248

Claims priority, application Japan, Apr. 14, 1973, 48-41832

Int. Cl.² B60K *41/18, 20/00;* **F16H** *5/60*

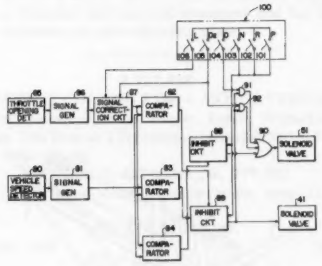
U.S. Cl. 74—866 **3 Claims**

1. A control system for an automotive vehicle with an automatic transmission having shiftable gear means for effecting a plurality of transmission gear ratios including a forward drive range consisting of a plurality of different forward drive gear ratios, and a hydraulic control circuit including a plurality of hydraulic servo mechanisms for shifting said gear means, said control system comprising:

a manually operable valve for controlling the flow of hydraulic fluid within said hydraulic circuit, said manually operable valve being structured to effect a position for each of said transmission gear ratios other than said forward drive range gear ratios, and one position only for all of said forward drive gear ratios;

manual shift lever means movable to a plurality of shift range control positions including at least one position for each of said plurality of transmission gear ratios to be effected by said transmission including each of said forward drive range gear ratios;

means interconnecting said manual shift lever means with said manually operable valve to effect actuation of said valve by said shift lever means only in said one forward drive range position and in all positions other than forward drive range positions, said interconnecting means being structured to permit movement of said shift lever means to all of said forward drive range positions without displacing said manually operable valve from said one forward drive range position;



shift valves for supplying fluid pressure to and exhausting fluid pressure from said hydraulic servo mechanisms to control said transmission gear ratios;

an electric control circuit including signal generating means responsive to the operating conditions of said vehicle for generating electrical signals representative of said operating conditions;

logic circuit means responsive to said signal generating means for emitting electrical signals corresponding to the shift ranges of said transmission upon receipt of signals from said signal generating means; and

drive means operative in response to receipt of signals from said logic circuit means to control operation of said shift valves;

said electrical circuit operating to effect shifting of said transmission gear ratios in accordance with the operating conditions of said vehicle for all of said gear ratios of said forward drive range in accordance with the position of said manual shift lever means when said shift lever means is in any of said forward drive range positions.

3,922,934
MACHINE FOR PREPARING CABLE

Robert Cooper Hiatt, Hillsboro, Oreg., assignor to Tektronix Inc., Beaverton, Oreg.

Filed Apr. 15, 1974, Ser. No. 461,043

Int. Cl.² H02G *1/12*

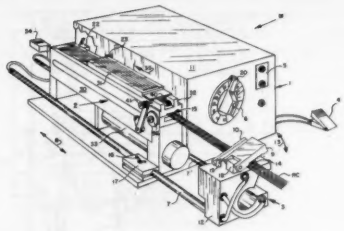
U.S. Cl. 81—9.51 **11 Claims**

1. A machine for preparing cable, comprising:

cable receiving means for receiving a length of cable to be prepared;

control means to control the amount of cable received by said receiving means;

movable cable length determining means carried by said cable receiving means; and



operating means connected to said control means for operating same.

3,922,935

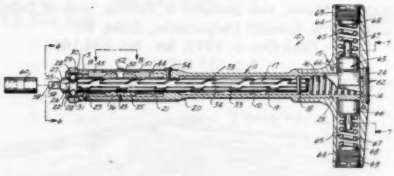
AUTOMATIC TORQUING TOOL

Walter E. Dahlem, 700 Ocean, Seal Beach, Calif. 90740

Filed Jan. 30, 1975, Ser. No. 545,491

Int. Cl.² B25B *17/00*

U.S. Cl. 81—52.4 R 10 Claims



1. A thrust-type torque wrench comprising an axially hollow body, a shaft disposed in the body for rotation therein about an axis of the shaft and for axial movement relatively into and out of one end of the body, one end of the shaft extending from the one end of the body and defining means adapting the shaft for torque transmitting engagement with the head of a threaded fastener and the like, means cooperating between the body and the shaft for converting axial motion of the body along the shaft toward the one end of the shaft into angular motion of the shaft in one direction about its axis and for preventing angular motion of the body relative to the shaft in the same direction essentially irrespective of the axial position of the shaft in the body, and means associated with the body operable essentially irrespective of the axial position of the shaft in the body for preventing effective application to the shaft of torque in excess of a selected torque value.

3,922,936

DRIVING A SINGLE SPINDLE LATHE

Helmut Link, Schanbach, Germany, assignor to Index-Werke KG Kahn & Tessky, Esslingen, Germany

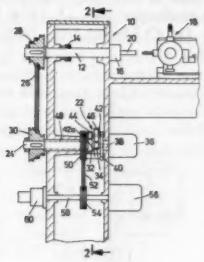
Filed Apr. 8, 1974, Ser. No. 458,587

Claims priority, application Germany, Apr. 27, 1973, 2321542

Int. Cl.² B23B *19/02*

U.S. Cl. 82—28 9 Claims

1. Apparatus for driving the spindle of a single-spindle lathe, comprising a drive shaft, means connecting said drive shaft to said spindle, a pair of drive motors for driving said drive shaft at selected rotational speeds, a planetary gear system operatively connecting said motors to said drive shaft and including said drive shaft as the output shaft thereof, the motor shaft of a first of said motors as the input shaft thereof, said output and input shafts being coaxially arranged, a first sun gear carried fixedly by said output shaft and a second sun gear carried fixedly by said input shaft, a bridge means rotatable about said input shaft having axle means associated therewith, said axle means mounting first and second planet gears engageable



respectively with said first and second sun gears, and a second of said motors being operatively connected to said bridge means to rotate same, at least one of said motors having a variable speed, at least one of said motors being reversible.

3,922,937

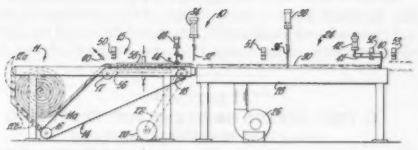
MACHINE FOR UNROLLING CHOPPING, AND FEEDING MATTED MATERIAL

Robert L. Maddox, Nashport, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 11, 1974, Ser. No. 522,406

Int. Cl.² B26D *7/18, 7/06, 5/20*

U.S. Cl. 83—99 28 Claims



1. A machine for unrolling a roll of matted fibrous material, chopping the material successively into mats of predetermined length, and feeding the chopped-off mats out in a controlled manner, the maching comprising a receptacle for loosely receiving a roll of matted fibrous material in a position for the feeding of the material from the bottom of the roll as the roll is rotated, an endless belt conveyor system including an endless movable belt, an upper portion of the belt defining an upwardly and forwardly inclined movable front portion of the receptacle, whereby movement of the belt rotates the roll and unwinds and feeds the matted fibrous material upwardly and forwardly from the bottom of the roll, a reciprocable chopping blade disposed forwardly of the endless belt and operable to chop the matted fibrous material successively into mats of predetermined length, an air conveyor system disposed forwardly of the chopping blade and including a plate for receiving the matted fibrous material after it passes the chopping blade and before it is chopped thereby, the air conveyor system being operable for feeding the chopped-off mats forwardly off the plate, and a movable gate associated with the plate for controlling the flow of the chopped-off mats.

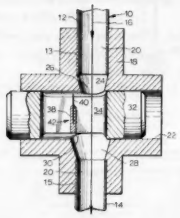
3,922,938
APPARATUS FOR THE CUTTING OF A YARN TRAVELLING IN A TUBE BY MEANS OF A FLUID

Jean-Claude Hautemont, Gif-sur-Yvette, and Rolland Sartopi, Roanne, both of Fr.nce, assignors to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 476,276, June 4, 1974, Pat. No. 3,864,998, which is a division of Ser. No. 375,068, June 29, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,615

Int. Cl.² B26D *5/04, 7/06*

U.S. Cl. 83—100 **8 Claims**



1. Apparatus for cutting yarn transported continuously at high speeds by fluid under pressure through a conduit, the axis of which coincides with the normal path of travel of said yarn, comprising

a yarn delivery tube and a yarn exit tube;

a sleeve having a central opening extending therethrough and a transverse opening perpendicular to said central opening, the end portions of said yarn delivery tube and said yarn exit tube coaxially aligned and carried in the upper and lower portions of said central opening, respectively;

cutting means carried within said transverse opening of said sleeve and adapted for transverse movement with respect to said normal path of said yarn, said cutting means including a cutting blade located in a plane parallel to said normal path of yarn; and

means to move said cutting means transversely between two positions located on either side of said normal path of said yarn whereby said cutting blade will be forced against and cut said yarn each time it crosses the path of said yarn.

3,922,939
FLYING SHEARS OR STAMP FOR TRAVELING MATERIAL

Walter Schlueter, Geesthacht, and Harald Dechow, Schwarzenbek, both of Germany, assignors to Hinrichs Gesellschaft m.b.H., Geesthacht, Germany

Filed Mar. 13, 1974, Ser. No. 450,786

Claims priority, application Germany, Apr. 14, 1973, 2318970

Int. Cl.² B26D *1/56*

U.S. Cl. 83—299 **7 Claims**

1. An apparatus for processing a continuously traveling web comprising, in combination,

a drive means to continuously feed said web, and

a means positioned downstream of said drive means for receiving said web from said drive means and processing said web into a plurality of pieces, said means comprising,

an upper tool carrier,

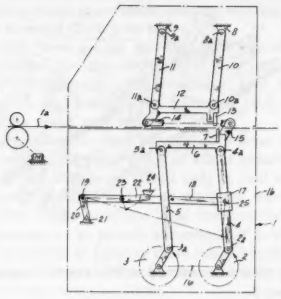
a lower tool carrier,

said tool carriers having tools held in parallel and acting in concert to operate on incident material,

rocker arms hingedly connected to said tool carrier,

adjustable means motively connected to a rocker arm for matching the horizontal velocity of the tools with the velocity of the material to be processed,

two crank gears of similar eccentricity arranged in parallel, acting in concert, rotatably connected to a pair of lower rocker arms communicating with the lower tool carrier, and



a connecting rod, tensionally and hingedly connecting and synchronizing the horizontal velocities of said tool carriers.

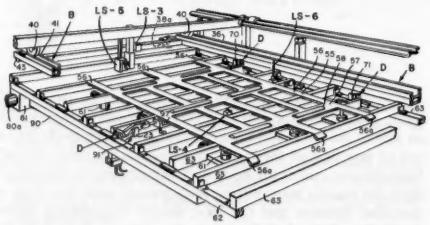
3,922,940
MACHINE FOR TRIMMING THE EDGES OF PANELS

Donald B. Morse, and Bernard A. Pribish, both of Joliet, Ill., assignors to Kemlite Corporation, Joliet, Ill.

Filed Oct. 5, 1973, Ser. No. 404,105

Int. Cl.² B27B *5/04*

U.S. Cl. 83—364 **9 Claims**



1. A machine for trimming the edges of panels comprising a pair of spaced saws, means for passing a panel past said saws to trim the side edges thereof, a second pair of spaced saws, a carriage having a bed thereon, clamping means for holding a panel which has been trimmed at its side edges on said carriage, said means including a pair of stop members mounted on said carriage in longitudinally spaced relation adjacent to one side edge of a panel disposed on said carriage, a clamping device mounted on said carriage adjacent the other side edge of said panel and longitudinally between said stop members, means for activating said device to clamp said panel against said stop members, and means for moving said carriage to pass the panel while clamped thereon past said second pair of saws to trim the end edges of said panel.

3,922,941
CAB STACKER AND MOBILE WORK STATION

Victor E. Carew, 610 W. Taylor Run Parkway, Alexandria, Va. 22314

Continuation-in-part of Ser. No. 364,388, May 29, 1973, abandoned. This application Aug. 13, 1974, Ser. No. 497,012

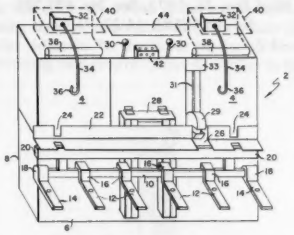
Int. Cl.² B23Q *7/04;* **B26D** *7/06;* **B23D** *47/04*

U.S. Cl. 83—417 **36 Claims**

1. A twin cab comprising:

a housing structure;

at least two compartments within the housing structure;
a fork carriage mounted on the housing;

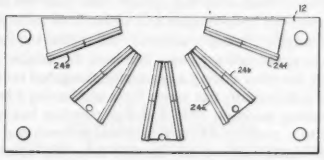


a cutting support mounted on the housing; and
cutting means mounted on said housing cooperating with said cutting support for cutting material placed on said support.

3,922,942
APPARATUS FOR CUTTING UP TIRE CASINGS

William E. Fawcett, Latrobe, and Alan L. Echtenkamp, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Sept. 6, 1974, Ser. No. 503,644
Int. Cl.² B26D *15/02*
U.S. Cl. 83—620 **8 Claims**



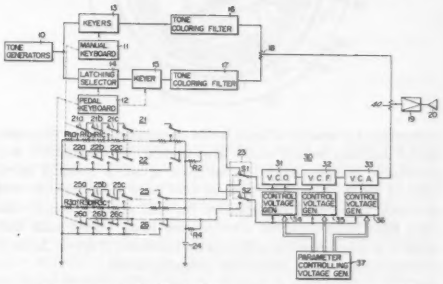
1. In a machine for cutting tire casings into circumferential segments; a pair of spaced support plates adapted for receiving a tire casing to be cut therebetween, knife members upstanding from the sides of the plates which face each other disposed in circumferentially spaced relation about a tire casing between the plates and substantially radial to the tire casing, each knife member on one plate adapted for cooperation with a knife member on the other plate to make a substantially radial cut through a tire casing placed between said plates when the plates are moved toward each other.

3,922,943
ELECTRONIC MUSICAL INSTRUMENT PROVIDED WITH A VOLTAGE-CONTROLLED MONOPHONIC PLAYING SECTION OPERATED BY A MANUAL OR PEDAL TONE-PLAYING SECTION

Naoyuki Niinomi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 1, 1974, Ser. No. 520,129
Claims priority, application Japan, Nov. 5, 1973, 48-127143[U]
Int. Cl.² G10H *1/00, 5/02*
U.S. Cl. 84—1.17 **6 Claims**

1. An electronic musical instrument comprising:
a manual keyboard having a plurality of keys;
a pedal keyboard having a plurality of keys;
a manual tone playing section including tone generators, first keyer means coupled to said tone generators and operatively coupled with said manual keyboard, and first tone coloring filter means coupled to said first keyer means;
a pedal tone playing section including tone generators, second keyer means coupled to said tone generators and operatively coupled with said pedal keyboard, and second tone coloring filter means coupled to said second keyer means;
first key controlled variable voltage source means operatively coupled with said manual keyboard for developing at a single output terminal thereof a first pitch determining voltage signal the amplitude of which is a function of the note of an operated key on said manual keyboard;
second key controlled variable voltage source means operatively coupled with said pedal keyboard for developing at a single output terminal thereof a second pitch determining voltage signal the amplitude of which is a function of the note of an operated key on said pedal keyboard;



a voltage controlled playing section including a voltage controlled oscillating means responsive to a pitch determining voltage signal for generating a tone signal the pitch of which is a function of the amplitude of the pitch determining voltage signal;
switch means coupled between said first and second key controlled voltage source means and said voltage controlled playing section and including a first switch for selectively coupling outputs of said first and second key controlled voltage source means to said voltage controlled oscillating means; and
sound reproducing means coupled to the outputs of said tone coloring filter means of said manual and pedal playing sections and to a tone signal output of said voltage controlled playing section.

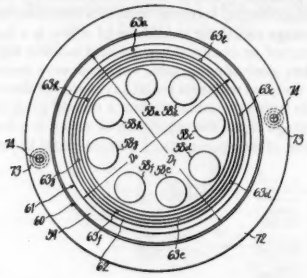
3,922,944
STEPPING MUSICAL MACHINE

Minoru Kurosaki; Tsutomu Nakamura; Akira Matuki; Okikazu Mogami; Yoshitomo Tsugu, and Masatoshi Morikawa, all of Kawasaki, Japan, assignors to Nippon Columbia Kabushiki Kaisha, Japan

Continuation of Ser. No. 275,694, July 27, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,557
Claims priority, application Japan, Feb. 12, 1972, 47-17539[U]; Feb. 18, 1972, 47-20245[U]; Apr. 4, 1972, 47-39726[U]
Int. Cl.² A63J *17/00;* **G09B** *15/04;* **G10C** *3/14;* **G10H** *5/00*
U.S. Cl. 84—1.01 **1 Claim**

1. An educational and amusement musical device comprising, a base member comprising a horizontal surface where a person can walk around, a plurality of musical jumping boards mounted on a portion of said horizontal surface and spaced such that a person can selectively step on to selected musical jumping boards or can step on the portion of said surface not having musical jumping boards, means for supporting said musical jumping boards in such a manner that said musical jumping boards move up and down with their surfaces going down substantially in parallel with the horizontal surface of said base member when the person steps on said musical jumping boards at any position thereof, a plurality of musical

tone producing means individually connected to individual jumping boards and respectively mounted in proximity to its respective jumping boards and the spatial arrangement of said plurality of jumping boards being spaced such that a person can selectively step on said horizontal surface during the selection of the next desired musical note, further including light means connected to and energized by said jumping boards as they are stepped upon, and wherein said light means



comprises a plurality of light bulbs corresponding to the number of jumping boards which are respectively illuminated as a particular jumping board is stepped upon, a musical score formed on the upper surface of said base member and said plurality of light bulbs mounted on said musical score with each light bulb adjacent a respective jump board such that when it is illuminated it indicates on the musical score the note corresponding to its particular jumping board.

3,922,945

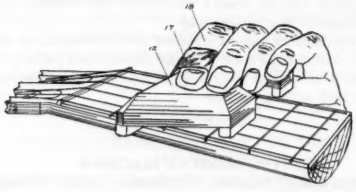
HAND HELD CHORD FINGERING DEVICE FOR GUITAR

Robert Pettijohn, Sierra Vista, Ariz., assignor to Robert Pettijohn, Sierra Vista, Ariz.

Filed Sept. 6, 1974, Ser. No. 503,756

Int. Cl. G10d *3/00*

U.S. Cl. 84—319 **6 Claims**



1. A completely unattached and hand held chord fingering device for the conventionally tuned six and twelve string six course guitars, comprising a rigid and generally palm sized body, hereinafter called a bracket, having incorporated therewith in fixed relationship to one another on its operative side multiple oblong string bearing surfaces, hereinafter collectively called fingering pads and individually referred to as first pad, second pad third pad, and remaining operative pad, wherein said fingering pads are of such peculiar dimensions and fixedly incorporated with said bracket in such unique placement and arrangement with respect to one another on said operative side of said bracket that, when said fingering pads as supported by said bracket are appropriately applied to the strings of said six course guitar at some given fret position below the twelfth fret, said fingering pads will stop said strings of said guitar at the individual string lengths required for the evocation of any one of four possible common musical chords, unaided by conjunctional manual fingering, at said fret position, whereas the remaining three said unaided chords can be formed by appropriately manipulating said device to appropriate locations at said fret position and reapplying.

3,922,946

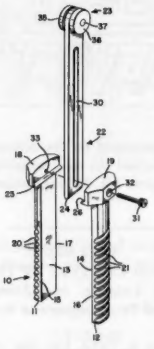
SPLIT BOLT

Boyd H. Grayson, Miamisburg, Ohio, assignor to The Dayton Sure-Grip & Shore Co., Miamisburg, Ohio

Filed Dec. 26, 1973, Ser. No. 427,781

Int. Cl.² F16B *13/10, 35/02*

U.S. Cl. 85—1 S **5 Claims**



1. A bolt of the character described, comprising bolt segments which when brought together render said bolt readily insertable into a complementary threaded recess, which have outer surfaces threadably engageable with such recess when said segments are spaced apart and which have head portions, and an elongated wedge member insertable between said segments to space said segments into such threadable relation, said wedge member having a generally elongated rectangular shape and substantially flat major faces and having a head end, means limiting insertion of said wedge member between said segments to a position wherein said wedge head end extends a predetermined longitudinal distance from the outer ends of said bolt segments and said bolt head portions, and boss means on said head end of said wedge member and located on said flat major faces a predetermined longitudinal distance from said bolt head portions for grasping and removing said wedge member from between said segments, said boss means and said head portions of said bolt segments being arranged so that a lever means can be used to apply a force between said boss means and said head portions to remove said wedge member.

3,922,947

DROP IN ANCHOR STUD

Ignazio Leonardo, Mountainside, and Eugene Coll, Cranford, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

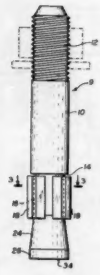
Continuation-in-part of Ser. No. 338,622, March 6, 1973, abandoned. This application Mar. 12, 1974, Ser. No. 450,392

Int. Cl.² F16B *13/06*

U.S. Cl. 85—77 **6 Claims**

1. An anchor stud assembly including in combination a stud comprising a mid-portion, a threaded upper end above the mid-portion, a lower portion that has a maximum diameter substantially equal to the diameter of the mid-portion and that has a frusto conical surface that tapers to a smaller diameter towards said mid-portion, a reduced diameter portion between the mid-portion and said frusto conical surface, a unitary collar of malleable metal extrudant extending circumferentially around the reduced diameter portion, a shoulder at the juncture of the mid-portion and the reduced diameter portion for holding the collar on the stud and for transmitting force to the collar when the stud is being tapped into a hole, the collar having a length as great as most of the length of the

reduced diameter portion, and the collar having its outside surface formed with a plurality of longitudinally-extending ridges and grooves, all of which extend for the full length of the collar and each of which is of uniform cross-section for its full length, the portions of the collar at the bottoms of the grooves being thinner, in a radial direction, than the portions of the collar adjacent to the sides of the grooves and the grooves including one groove where the collar is thinner than



at the other grooves and along which the collar breaks into two generally semi circular pieces as the collar is expanded by upward movement of the frusto conical portion with respect to the collar, and the thin portions at the bottoms of the other grooves providing areas of circumferential extent at which the malleable metal of the collar stretches as the collar is expanded by the frusto conical surface to increase the pressure of the collar against the side of a hole into which the stud is inserted.

3,922,948

DETONATING SYSTEM

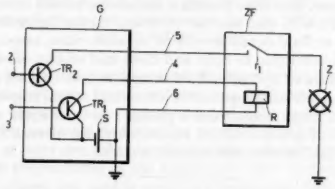
Friedrich Wilhelm Krehan, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm G.m.b.H., Munich, Germany

Filed Mar. 25, 1974, Ser. No. 454,548

Claims priority, application Germany, Mar. 29, 1973, 2315704

Int. Cl.[2] F42C *15/12*

U.S. Cl. 89—1.5 F 6 Claims



1. A circuit arrangement for releasing a bomb lock of an aircraft, comprising an electrically ignitable primer cartridge for opening the bomb lock, said cartridge having a housing grounded to the aircraft structure, an ignition line connected to the cartridge, a pair of floating leads, a command switch for generating a detonating pulse and a relay switching pulse, a relay having a winding and a contact said contact being connected to the ignition line, said winding being connected via the floating leads with the command switch, said command switch actuating said winding through said floating leads and passing an ignition current through said ignition line.

3,922,949

GUN TURRET WITH AN OBSERVATION OPENING CLOSABLE BY A HATCH COVER

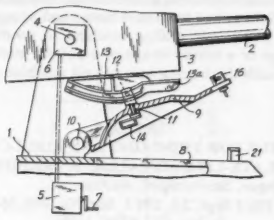
André Mechulam, Tarbes; Bruno M. Saintours-Payerne, St. Etienne; Guillaume A. Gay-Chatain, St. Etienne, and Paul R. Montjallard, St. Etienne, all of France, assignors to Etat Francais, Paris, France

Filed Mar. 5, 1974, Ser. No. 448,419

Claims priority, application France, Mar. 8, 1973, 73.08235

Int. Cl.[2] F41H *5/22*

U.S. Cl. 89—36 L 10 Claims



1. Military equipment comprising a turret, at least one gun mounted for pivotal movement in elevation, means controlled from within the turret to adjust the angle of elevation of said gun, said turret including an upper wall with an observation opening therein, a hatch cover pivotably mounted on said upper wall adjacent said observation opening to controllably open and close the same, the hatch cover being so pivotably mounted on said upper wall to provide a field of view through the observation opening corresponding to the direction of aim of the gun, and means outside said turret for coupling said cover and gun to cause the cover to follow the pivotal movement of the gun, said coupling means comprising means for providing a coupling connection between said cover and gun only for angles of elevation of the gun greater than a threshold level.

3,922,950

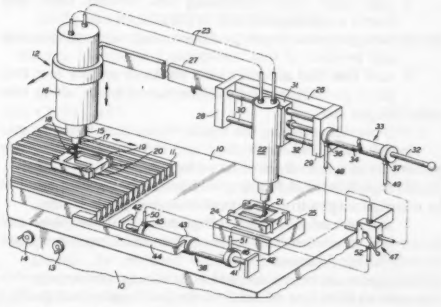
REVERSIBLE PATTERN-TRACING CONTROL FOR A DUPLICATING MILLING MACHINE

James E. Walter, c/o Columbus Impression Die Co., Inc., 6211 Shamrock Lane, Amlin, Ohio 43002

Filed Mar. 1, 1974, Ser. No. 447,147

Int. Cl.[2] B23C *1/16*

U.S. Cl. 90—13.2 1 Claim



1. In combination with a duplicating milling machine which includes a work-supporting table arranged for transverse movement beneath a longitudinally and vertically movable, rotary cutting tool and a pattern-tracing unit disposed in laterally spaced relation to said cutting tool but coupled for vertical and longitudinal movement with said cutting tool; that improvement which comprises: means for stationarily supporting a three dimensional pattern beneath the pattern-trac-

ing unit of said machine; a reciprocative hydraulic motor connected with the pattern-tracing unit of said machine and operable to reciprocate said unit in a direction transverse to the longitudinal direction of movement of said cutting tool; pump means connected with the work-supporting table of said machine and hydraulically connected to transfer fluid under pressure to and from said motor in response to movement of said work-supporting table, said motor and pump means comprising cylinder-piston units of equal volumetric displacement connected in a closed hydraulic circuit; and a selector valve connected in the hydraulic circuit between said motor and pump means and operable selectively to reverse the direction of flow of fluid to and from said motor and pump means, and thereby to cause said milling machine to produce either a direct image or a mirror image of a pattern stationarily supported beneath the tracing unit of said machine.

3,922,951

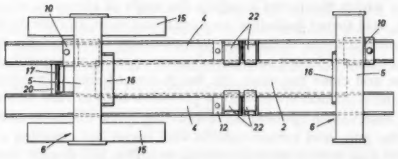
APPARATUS FOR TRIMMING AND EDGE-CUTTING A PLATE-LIKE METALLIC WORKPIECE

Ernst Linsinger, Steyrermuhl, Austria

Filed Sept. 24, 1973, Ser. No. 400,266

Int. Cl.² B23C *1/08*

U.S. Cl. 90—15 R **6 Claims**



1. Apparatus for trimming and edge-cutting a plate-like metallic workpiece having a major face and a plurality of edges narrower than said major face and bounding the same, comprising:

a. a base having two parallel length sides and two parallel width sides perpendicular to said length sides;

b. supporting means on said base for supporting said workpiece in a position in which said face extends in a predetermined plane;

c. at least one milling cutter unit;

d. guide means for guiding said at least one unit laterally of and parallel to said edges,

1. said guide means including first, second, third, and fourth straight guide tracks parallel to said plane,

2. said guide tracks jointly surrounding said workpiece in said position of said workpiece,

3. said first and second guide tracks extending in a first plane parallel to said predetermined plane along said length sides;

e. two portals spanning the width of said base between said length sides and supporting said third and fourth guide tracks respectively in a second plane,

1. said third and fourth guide tracks being elongated at right angles to said first and second guide tracks,

2. said second plane extending above said first plane and said predetermined plane when said predetermined plane is horizontal;

f. engagement means on said at least one unit engageable with at least one of said tracks for longitudinal guiding movement of said at least one unit on the engaged track,

1. said at least one unit including a milling cutter rotatable about an axis perpendicular to said planes in cutting engagement with one of said edges when said at least one unit moves on said tracks,

2. said milling cutter projecting downwardly from said second plane when said at least one unit is guided by said third and fourth tracks.

3,922,952

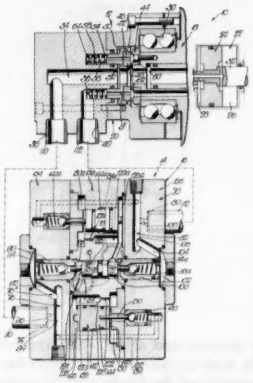
HYDRAULIC OPERATING MECHANISM FOR A ROTARY CHUCK

John J. Roddy, Meriden, and Alfred G. Higley, Enfield, both of Conn., assignors to Cushman Industries, Incorporated, Hartford, Conn.

Filed Apr. 4, 1973, Ser. No. 347,922

Int. Cl.² F15B *11/08, 13/042;* **B23B** *31/30*

U.S. Cl. 91—29 **5 Claims**



1. In hydraulic chuck operating mechanism, the combination of a swivel coupling with stationary and operationally turning companion parts, of which the turning part provides a cylinder with a piston defining therein a chuck-closing cylinder side; a conduit, including a port in said coupling leading to said cylinder side, for passing hydraulic fluid under pressure to said cylinder side, with said port crossing said coupling parts; port sealing means in said coupling at the port crossing; a check valve in said conduit dividing the same into first and second conduit sections of which said second section extends from said valve to said cylinder side, with said valve being normally closed to block fluid flow from said cylinder side, and being opened by fluid in said first conduit section under a pressure in excess of that of fluid in said cylinder side to introduce fluid into said cylinder side and opened by piston means to release fluid from said cylinder side; and a fluid pressure control for said cylinder side, providing a bypass in said conduit around said check valve, a second valve in said bypass forming part of the latter when open, a constriction in said bypass, and fluid pressure responsive means operatively associated with said second valve and having opposite faces exposed to fluid in said bypass on opposite sides, respectively, of said constriction to open and close said second valve when the pressure of hydraulic fluid in said second conduit section is within a certain range and is above said range, respectively, with said range being from a pressure at least equal to, to a pressure of predetermined excess over, the pressure of hydraulic fluid in said first conduit section.

3,922,953

SYSTEM FOR LIMITING THE FORCE OF REACTION IN HYDRAULIC SERVO-CONTROL DEVICES

Gunther Strauff, Kaarst, Germany, assignor to Langen & Co., Duesseldorf, Germany

Filed Nov. 12, 1973, Ser. No. 415,168

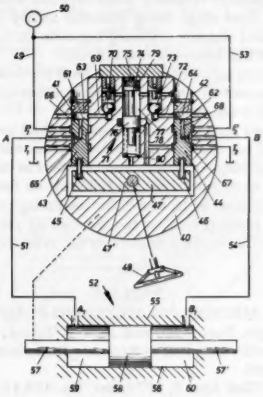
Claims priority, application Germany, Nov. 16, 1972, 2256072

Int. Cl.² F15B *9/10*

U.S. Cl. 91—371 **2 Claims**

1. A system for limiting the force of reaction in hydraulic servo-control devices, comprising in combination an actuating member, a servo-motor provided with working chambers

defined by movable members including a piston and a cylinder, a power output member movable relative to the actuating member and connected to one of the movable members of the servo-motor, a valve mechanism connecting the working chambers of the servo-motor interchangeably with a fluid pressure source and a drain, means for actuating said valve mechanism upon relative movement between the actuating member and the power output member drain and reaction members operatively connected to the actuating member for reacting upon the actuating member and defining reaction



chambers, the reaction members being subject to pressure developed in the reaction chambers, each reaction chamber being connected with a respective working chamber, the pressure in the reaction chambers being limited to a predetermined value, whereby said reaction members are subjected to a pressure-limitation of a substantially constant value, the improvement comprising means connecting each reaction chamber with a respective working chamber via throttle means and a single pressure-limiting valve means connected to each reaction chamber via one-way valve means.

3,922,954

LOAD-SENSING AND PRESSURE-LIMITING DEVICE WITH ACCELERATED TRIPPING

Karl Paul Gustafsson, and Lars-Olov Frisk, both of Gavle, Sweden, assignors to AB Tico, Gavle, Sweden

Filed Aug. 3, 1973, Ser. No. 385,269

Claims priority, application Sweden, Oct. 5, 1972, 12892/72

Int. Cl.² F15B *13/06*

U.S. Cl. 91—412 **5 Claims**

1. A load sensing and pressure limiting device for a fluid-powered appliance having at least two fluid driven working motors, supplied from a common hydraulic supply line, in which the load on a first working motor is variable by operation of at least one other working motor, wherein a pressure which is proportional to the load on the first working motor is to be sensed and used to avoid overloading the first working motor by the other working motors, comprising:

a. a housing (28) having a first cylindrical recess, a second cylindrical recess, a second hydraulic inlet port (10) communicating with said first cylindrical recess, a second hydraulic inlet port, at least a third hydraulic inlet port, and an hydraulic outlet port, each communicating with said second cylindrical recess,

b. a primary piston slidably retained in said first cylindrical recess,

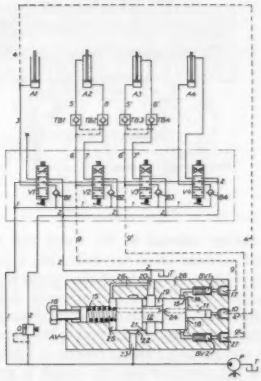
c. a secondary piston rigidly connected to said primary piston and slidably retained in said second cylindrical recess, said secondary piston having a larger cross-sectional area than said primary piston,

d. spring means interposed between said secondary piston and said housing to normally bias said primary and said secondary pistons in one direction, such that said secondary piston closes said second and third hydraulic inlet ports,

e. first conduit means connecting the hydraulic supply line to said second hydraulic inlet port,

f. at least a second conduit means connecting the at least one other working motor to said at least third hydraulic inlet port such that hydraulic pressure acting on said at least one other working motor is transmitted thereto,

g. third conduit means connecting said hydraulic outlet port to a hydraulic return line, and



h. fourth conduit means connecting said first working motor with said first hydraulic inlet port to transmit the hydraulic pressure acting on said first working motor to said primary piston causing the primary and secondary pistons to move against the spring biasing means to uncover the second and third hydraulic inlet ports thereby causing said hydraulic pressure acting on said at least one other working motor to act on said second piston to increase its movement against the spring biasing means and allowing the second hydraulic inlet port to communicate with the hydraulic outlet port to reduce the supply line hydraulic pressure.

3,922,955

FAIL-FIXED SERVOVALVE

Howard Berdolt Kast, Fairfield, Ohio, assignor to General Electric Company, Lynn, Mass.

Filed Jan. 29, 1974, Ser. No. 437,667

Int. Cl.² F15B *11/08, 13/043*

U.S. Cl. 91—461 **7 Claims**

1. A servovalve comprising:

a jet pipe for discharging a jet of pressurized liquid;

deflecting means responsive to an input signal for deflecting the jet pipe in a direction determined by the input signal;

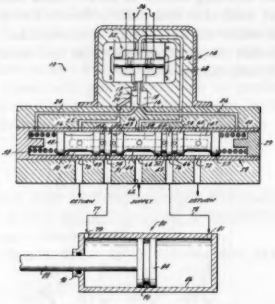
a sleeve having a plurality of ports therethrough one of which receives an inlet flow of pressurized liquid;

a spool translatably disposed within the sleeve and centered therein by resilient means at opposing ends thereof wherein the spool includes a plurality of circumferentially relieved areas interspaced between a plurality of circumferential lands and wherein selected relieved areas may be placed in flow communication with selected ports in the sleeve by translation of the spool;

a pair of receiver passages in flow communication with opposite ends of the sleeve and disposed to accept an equal amount of liquid from the jet pipe when the jet pipe is in the non-deflected position and an unequal amount of liquid when the jet pipe is in the deflected position

whereby an input signal to the deflecting means operates to deflect the jet pipe causing the receiver passages to receive unequal amounts of liquid and thereby unbalance the pressure at opposing ends of the spool to cause the spool to translate in the direction of lower pressure;

a servopiston having a piston translatably disposed within a bore each side of which communicates with separate ports in the sleeve;



passage means internal to the spool and interconnecting selected relieved areas for delivering a pulse of pressurized liquid to a first side of the piston and porting away pressurized liquid from the opposite side of the piston when the spool is translated in one direction and delivering a pulse of pressurized liquid to the opposite side of the piston and porting away pressurized liquid from the first side of the piston when the spool is translated in the opposite direction such that there is no fluid flow to the servopiston when the spool is fully translated in either direction.

3,922,956

HYDRAULIC MOTORS

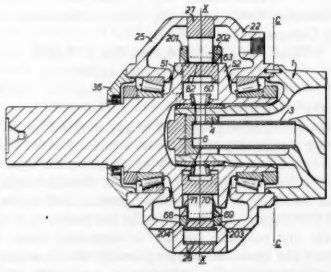
Kenneth William Samuel Foster, Prestbury, England, assignor to Renold Limited, Manchester, England

Continuation-in-part of Ser. No. 304,748, Nov. 8, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,117

Claims priority, application United Kingdom, Nov. 9, 1971, 52039/71

Int. Cl.² F01B *1/06*

U.S. Cl. 91—491 **2 Claims**



1. An hydraulic motor comprising:

an annular cam track,

an assemblage of pistons and cylinders rotatable therewithin, said pistons being mounted on a rotatable member to form a rotor;

roller followers mounted to respective pistons so that the roller followers are disposed at least in part within the cylinders, the roller followers, at least during operation of the motor, running in engagement with and making substantially line contact with the cam track, and the roller followers having an axial length which is about equal to their diameters and which is less than the diameter of the piston to which they are mounted;

restraining means on the motor casing and making sliding contact with the roller followers for locating and restraining the roller followers axially with their axes of rotation parallel with the axis of rotation of the assemblage of pistons and cylinders, said restraining means comprising two stationary retaining rings between which said rotor rotates, said rings being retained axially in the motor casing and slidably engaging opposite circular end faces of the roller followers respectively,

said rotatable member having cut away portions on opposite sides thereof to provide a clearance between said rotor and said rings, and

valve means for alternately supplying fluid under pressure into and for allowing it to exhaust from each cylinder of the assemblage of pistons and cylinders as the assemblage rotates, to thereby drive the followers on the outstroke of the pistons so as to cause the assemblage to rotate, the pistons being driven on the instroke by the followers to exhaust the working fluid from the cylinders.

3,922,957

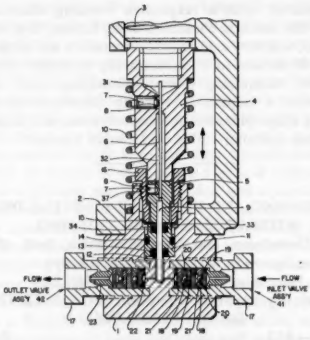
MICROFLOW METERING PUMP

David G. Ogle, Sunnyvale, and John T. Taylor, Santa Clara, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 8, 1974, Ser. No. 459,111

Int. Cl.² F01B *9/00*

U.S. Cl. 92—137 **12 Claims**



1. In a pump having a reciprocating plunger with forward and return strokes, piston means axially movable with respect to a sealed bore and a coupling between the plunger and the piston means, connected thereto, the improvement which comprises that:

the piston means includes a piston of smaller diameter extending in the sealed bore and a piston holer of greater diameter having a bore and an end surface,

the plunger has a bore and an end surface,

the coupling is in the form of a wire composed of a material having the properties of steel with a high modulus of elasticity, and being secured at the ends in the bores of said piston holder and said plunger,

the end surfaces of the plunger and the piston holder are adapted to abut each other whereby upon a forward stroke of the plunger it presses against the piston holder axially, and

the diameter of the bore of the plunger from the end surface bearing against the abutting surface of the piston holder

to a point spaced from such end surface is of greater diameter than the remaining portion of the coupling-receiving bore, whereby the coupling wire has lateral freedom of movement adjacent the piston means enabling the piston means to float laterally.

3,922,958

PACKAGING

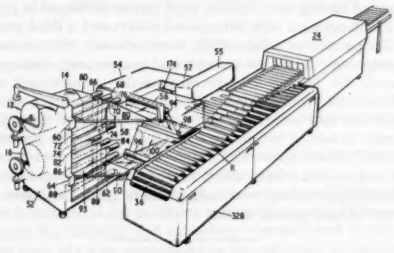
Frederick Douglas Clavell Bate, 155 Barkerhouse Road, Nelson, Lancashire, England

Continuation-in-part of Ser. No. 341,526, March 15, 1973, Pat. No. 3,881,296. This application Mar. 1, 1974, Ser. No. 447,268

Claims priority, application United Kingdom, Mar. 15, 1973, 12542/73; June 29, 1972, 30399/72

Int. Cl.² B31B *1/66, 1/16*

U.S. Cl. 93—33 H 22 Claims



1. A method of forming a package, which includes the steps of: continuously feeding two layers of wrapping film through a sealing station at a preselected velocity; selecting the cycle frequency of a reciprocable sealing device having a path parallel to that of the film feed to determine the distance between transverse seals formed by said sealing device on said two layers of wrapping film; selecting the stroke length of said sealing device so that it travels in a forward direction at the same linear speed as the film, and bringing the sealing device into operative relationship with the layers of film during at least part of its forward travel in each cycle to produce a transverse sealing together of the two film layers.

3,922,959

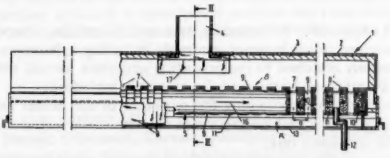
AIR OUTLET CASING

Willem Marinus Treffers, Baarn, Netherlands, assignor to Technisch Adviesbureau Treffers B.V., Baarn, Netherlands

Filed Dec. 20, 1973, Ser. No. 426,558

Int. Cl.² F24F *13/08*

U.S. Cl. 98—40 A 15 Claims



1. An air outlet device comprising, in combination:

an oblong casing having at least one inlet opening to be connected to an air supply and having a wall portion defining a recess along the length of the casing through which air is discharged from the casing, and said wall portion being provided with spaced apart solid portions defining therebetween outlet openings spaced along the length of the recess; and

an elongate regulating member rotatably and axially slidably received in said recess, said regulating member having a plurality of spaced flow channels therethrough whereby axial sliding of said regulating member effects greater and lesser blocking of said flow channels by said solid portions while rotation of said regulating member controls the direction of air discharge from said recess.

3,922,960

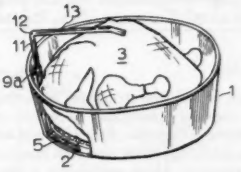
AUTOMATIC BASTING DEVICE

Bob Lewis, Louisville, Ky., assignor to T. M. Sullivan and Joseph A. Manners, Sr., both of Clarksville, Ind.

Filed Nov. 12, 1973, Ser. No. 414,977

Int. Cl.² A47J *37/10*

U.S. Cl. 99—346 2 Claims



1. An automatic basting device, comprising in combination:

A. a base support and an immersion plate for installation on the bottom of a baking pan and a baking rack carried in said pan above said plate for supporting meat to be cooked;

1. said plate having a down-turned peripheral rim portion and a raised planar portion which forms a collection space between the bottom of said pan and the bottom surface of said raised planar portion, and,
2. openings in said rim of said plate for admission of meat drippings and broth from said meat as it is being cooked into said collection space,

B. a delivery and dispensing tube in open communication with said collection space of said plate for receiving boiling meat drippings and broth from said collection space and for delivering and dispensing same to baste meat in said pan, which comprises:

1. a tubular vertical delivery arm;
2. an open ended tubular horizontal delivery and dispensing arm, and;
3. a tubular elbow joining said tubular vertical and horizontal arms together;

the improvement in said automatic basting device, which comprises:

C. openings in the bottom of said horizontal delivery and dispensing arm for dispensing the boiling hot drippings and broth over the meat, and,

D. a down-turned portion at the open distal end of said horizontal tubular arm for directing the boiling hot meat drippings and broth downwardly through said open distal end over the meat and thus prevent discharge of said boiling hot meat drippings and broth out of the pan.

3,922,961

ROTARY COOKING DEVICE

Arol L. Case, 5311 Zadell Ave., Temple City, Calif. 91780

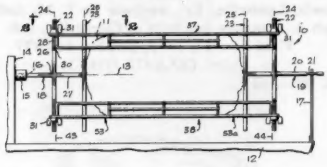
Filed Feb. 4, 1974, Ser. No. 439,297

Int. Cl.² A47J *37/04, 37/07*

U.S. Cl. 99—427 10 Claims

1. A rotary cooking device comprising two opposite end hub structures adapted to be mounted at spaced locations for rotation about a common axis, and two grills to be located at opposite sides of said axis for engaging opposite sides of a piece of meat and connectible near opposite ends of said grills to said hub structures respectively and for generally radial adjustment relative thereto, each of said hub structures having

a first pair of elongated members projecting radially outwardly from said axis in essentially diametrically opposite directions and slidably received in guideways formed in said two grills respectively to mount the grills for guided radial movement, fasteners connected to said two elongated members radially outwardly beyond said grills respectively and adjustable longitudinally of said members to clamp said grills against opposite sides of the meat in any of various different settings of the



grills, and each of said hub structures including a second pair of elongated members projecting outwardly away from said axis in diametrically opposite directions and essentially parallel to but spaced axially from said first members respectively and slidably received within guideways in the grills to coact with the first pair of elongated members in maintaining a predetermined orientation of the grills with respect to the hub structures in different radial settings of the grills.

3,922,962

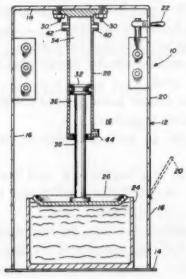
COMPACTION SYSTEM

Werner P. Goldkuhle, 1405 Cedar Ridge, Euless, Tex. 76039

Division of Ser. No. 222,598, Feb. 1, 1972, Pat. No. 3,805,690. This application Jan. 18, 1974, Ser. No. 434,830

Int. Cl.[2] B30B 15/16

U.S. Cl. 100—53 **7 Claims**



1. A compaction system comprising:
a bin for receiving material to be compacted;
a ram mounted for reciprocation into the bin;
a piston operatively connected to the ram;
means for applying low pressure operating fluid to the piston and thereby advancing the ram into the bin and into engagmement with material therein;
pressure multiplier means driven by low pressure operating fluid for producing high pressure operating fluid; and
means driven by the high pressure operating fluid for applying a relatively large force to the ram subsequent to the advance thereof and thereby actuating the ram to compact the material in the bin.

3,922,963

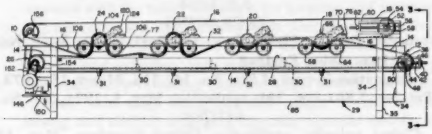
FRUIT PRESS

Martin I. Sanderson, 132 Grove St., Salinas, Calif. 93901

Filed June 11, 1974, Ser. No. 478,297

Int. Cl.[2] B30B 9/24

U.S. Cl. 100—118 **8 Claims**



4. A fruit press comprising a conveyor apparatus having two endless conveyor webs arranged superimposed, in part, for compressing fruit therebetween; a plurality of compressing stations having three rollers, each station arranged in pyramidal juxtaposition with two spaced rollers and a third pressure roller positioned substantially therebetween; drive means for transporting said webs through said compressing stations; and means for biasing said pressure roller against said webs, wherein said rollers in said compressing stations are arranged to permit said webs to be selectively transported through said station in one of two paths; a first path being over one of said spaced rollers, under said pressure roller, and over the other of said spaced rollers; and a second path being under one of said spaced rollers, over said pressure roller, and under the other of said spaced rollers.

3,922,964

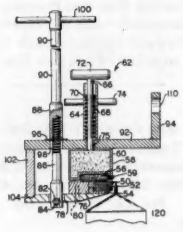
DEVICE FOR MARKING CARTONS BY BRANDING

Homer J. Fisher, deceased, late of Cuyahoga Falls, Ohio, and by Helen I. Fisher, executrix, 413 Archdale Ave., Cuyahoga Falls, Ohio 44221

Filed May 23, 1974, Ser. No. 472,881

Int. Cl.[2] B41F 17/24; B44B 5/02

U.S. Cl. 101—9 **8 Claims**

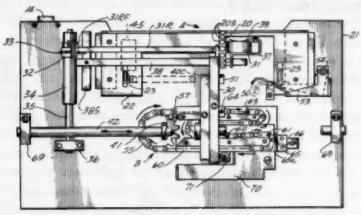


1. Apparatus for branding data onto an article, comprising:
a reciprocating hammer assembly including a hammer head movably attached to reciprocation actuation means; and
a stationary heater and die assembly including:
a frame for containing the structure of the heater and die assembly and having a slot therein;
an insulated box;
a push rod removably received within the slot and having a biasing spring thereabout on one side of the frame and being connected to the insulated box on the other side of the frame, the spring urging the insulated box into frictional securing engagement with the frame;
a heating element secured to the insulated box;
at least one die in contacting engagement with the heating element and positioned opposite the hammer head;
means for retainingly engaging the die with the heating element.

3,922,965
DOCUMENT PRINTER

John D. Platt, South Laguna, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.

Filed Dec. 26, 1973, Ser. No. 428,182
Int. Cl.[2] B41J *3/04, 3/10, 29/40*
U.S. Cl. 101—93.04 8 Claims



1. A printer for printing on documents such as checks and the like comprising

a housing having an aperture for receiving a document and inserting the document completely within the housing for printing thereon,

means for receiving and holding the document to be printed in a stationary position to be printed on,

means for signalling the receipt and correct positioning of the document in the receiving means for printing thereon,

means for defining and traversing a preselected serpentine path of travel corresponding to a plurality of lines on a document to be printed, said path defining means comprising a power driven chain, means for guiding the chain over the preselected, serpentine path whereby a point on the chain traces said path from a starting point, around the path and comes to rest at the starting point to trace a path corresponding to the traversing of the lines on the document to be printed,

means for actuating the path defining means,

printing means,

means for mounting said printing means to said latter-mentioned means to cause the printing means to duplicate the preselected path of travel upon actuation thereof and thereby traverse across the face of the document to be printed in a plurality of lines,

means for signalling the positioning of the printing means at each line for initiating the printing in a line upon the operation of the signalling means,

a plurality of means carried by the path defining means for sequentially operating said signalling means at a plurality of points in the path corresponding to the plurality of lines on the document to be printed,

means for ejecting a printed document through the housing aperture, and

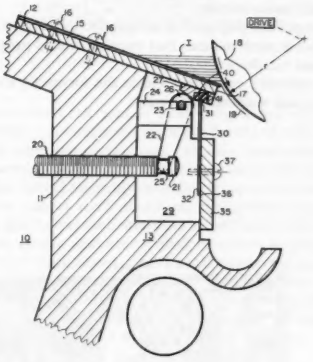
means carried by the path defining means for operating the ejection means at a preselected point in the path corresponding to the complete traversal of the document by the printing means.

3,922,966
INK FOUNTAIN IN PRINTING PRESSES

Janko Despot, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Mar. 4, 1974, Ser. No. 447,752
Claims priority, application Germany, Mar. 7, 1973, 7308585[U]
Int. Cl.[2] B41F *31/06;* B41L *27/08*
U.S. Cl. 101—350 1 Claim

1. In an ink fountain, the combination comprising a frame, a fountain roller mounted in the frame and extending parallel to it, the frame including a vertically extending wall portion providing an upwardly facing supporting surface as well as a base portion, a fountain blade secured to the supporting surface and having a projecting portion terminating in a tip extending into operative engagement with the under surface of the roller to define an ink film thereon said blade having on its bottom side a cam follower portion spaced inwardly of said tip, the base portion projecting laterally from the wall in the same direction as the blade, the projecting portion of the blade and base portion of the frame vertically opposed thereto being of approximately equal dimension and together defining a longitudinal chamber under the blade, a body of ink above the blade, means for rotating the roller so that its surface rotates downwardly through the body of ink, adjusting mechanism in the chamber engaging the underside of the blade and including a series of adjusting screws which penetrate the wall portion and which are sealed with respect to it, the screws having individual cams engaging the blade along said cam follower portion so that as the screws are operated the tip of the blade undergoes localized adjusting movement toward and away from the surface of the fountain roller, a closure plate



which extends generally vertically so as to make an obtuse angle with the blade as well as extending longitudinally of the frame to enclose the chamber, said closure plate having an upper edge extending to within a short distance of the underside of the blade adjacent said tip and having a lower edge which is stationarily secured to the laterally extending base portion of the frame for making a leakage tight joint with the latter, and a resilient strip extending continuously along the upper edge of the closure plate to seal the joint between the closure plate and the underside of the fountain blade so that the chamber is substantially sealed against paper dust and ink either in liquid form or in the form of airborne ink mist, the strip being formed of elastomeric material continuously joined to the upper edge of the closure plate and continuously joined to the underside of the blade at the tip thereof so as to enclose within the chamber, the screws, cams, and cam follower region, the strip being sufficiently resilient so that localized adjusting movements of the blade are accommodated by elastic deformation of the resilient strip while preserving the integrity of the seal.

3,922,967
CLOSED-BREECH-GUN-FIRED ROCKET-ASSISTED PROJECTILE

William J. Mertens, Cambridge City, Ind., assignor to Avco Corporation, Cincinnati, Ohio

Filed Mar. 29, 1974, Ser. No. 455,988
Int. Cl.[2] F42B *13/10, 9/10;* F42C *1/04*
U.S. Cl. 102—38 11 Claims

1. A closed-breech gun-fired rocket assisted projectile comprising the following, in combination:

a cartridge comprising a base formed with a forwardly extending central portion having a bore therein, said

cartridge being further formed with an annular shoulder and a forwardly extending hollow cylindrical wall;

an igniter disposed in said bore and adapted to initiate the firing of said projectile from a gun;

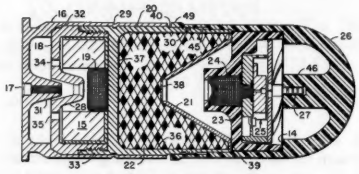
a warhead housing of generally cylindrical configuration adapted to be frictionally fitted to said cartridge in such manner that sufficient gas pressure separates said warhead housing and cartridge, said warhead housing comprising a forwardly extending hollow wall and an intermediate partition and a rearwardly extending hollow wall;

a rocket propellant housing formed to be secured to the rearwardly extending wall of the warhead housing and positioned by said annular shoulder in spaced relation to the base of said cartridge, said rocket propellant housing having a rear wall formed to define a forwardly extending main nozzle, said propellant housing being further formed with a frontal recess and a rear wall having auxiliary nozzles oriented so that gases flowing therethrough produce rotation;

a booster centrally disposed within said recess and opposite said main nozzle;

a propellant disposed in concentric relation to said booster and in such manner that burning of said propellant opens said auxiliary nozzles;

an explosive contained within the forwardly extending wall of said warhead housing;



means for confining said explosive comprising a generally frusto-conically shaped liner positioned to be convex relative to the explosive and having an annular forward rim;

a plastic ogive formed with a rearwardly extending hollow cylindrical wall and an intermediate shoulder and a blunt face and a rearwardly extending central post;

a firing pin mounted on said post;

said forwardly extending wall of the warhead housing being formed with annular step-shoulders and teeth adapted to have the rearwardly extending wall of the ogive slid thereover in order to accomplish a forced fit, said rearwardly extending ogive wall being formed so that said fit provides an annular band at the margin of said rearwardly extending ogive wall;

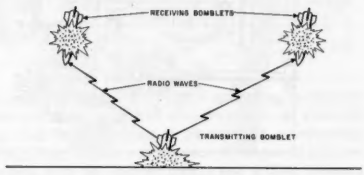
a plastic spitback housing interposed between said annular rim and said intermediate shoulder of said ogive, said spitback housing comprising a rearwardly extending central bore and a forwardly disposed recess adapted to contain a fuze;

a spitback charge within the last-mentioned bore and a fuze within the last-mentioned recess, said fuze being adapted to be armed to locate said firing pin and said spitback charge in a firing train, said fuze being further adapted, on impact with a target, to impact said firing pin and to explode the projectile.

3,922,968
BOMBLET FUZE SYSTEM

Robert L. Conger, Riverside; John A. Parks, Corona, and Leslie T. Long, Orange, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 9, 1970, Ser. No. 56,033
Int. Cl.[2] F42C *13/04*
U.S. Cl. 102—70.2 P 6 Claims



1. A fuze system for bomblets dropped in a cluster to detonate a majority of the bomblets above the ground for greater effectiveness, comprising:

a. a greater majority of the bomblets in said cluster, each containing an RF receiver means;

b. a transmitter means in at least one bomblet of said cluster;

c. said RF receiver means comprising an antenna connected to an RF receiver, which in turn is connected to a detonator;

d. said transmitter means comprising a high explosive electric pulse generating means connected to an RF transmission circuit which in turn is connected to a transmitting antenna;

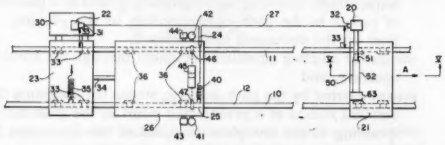
e. said high explosive electric pulse generating means being detonated by a contact fuze connected thereto;

f. said high explosive electric pulse generating means comprising an explosive magnetic flux compressor which produces high current pulses.

3,922,969
MOVING PROJECTOR SYSTEM

William J. Tyler, Valois, Canada, and Helmut Von Beckmann, Columbia, S.C., assignors to Canron, Inc., Phillipsburg, N.J.

Filed Feb. 21, 1974, Ser. No. 444,349
Int. Cl.[2] E01B *27/17*, *29/16*, *33/00*
U.S. Cl. 104—8 11 Claims



1. A lining system for aligning a length of railroad track extending between two locations along a correct line, the amount of error relative to said correct line in the alignment of the track at said two locations having been determined, comprising a reference beam projector mounted on first support means for travel over track, a reference beam receiver mounted on second support means for travel over track, a shadowboard mounted on further support means to indicate the position of a piece of track being aligned to said receiver, said shadowboard being located between said projector and said receiver along the intended line of projection of the reference beam, track aligning means for moving said piece of track in a direction indicated by said receiver, means for continually adjusting the location of said projector in the transverse direction of the track relative to the adjacent track

on which said projector is located as said projector moves between said two locations according to said amount of error at each location and the existing location of said projector along the length of track, said adjusting means including first recording means for recording while said projector moves along the track between said two locations the amounts of error at each of said two locations and for indicating at a given moment in time the location of said projector along said length of railroad track, said first means for recording the amounts of error comprising two positive and negative voltage sources and voltage control means for controlling the amount of voltage from each source, each of said amounts corresponding to the amount of error at one of said two locations, said first means for indicating the location of said projector comprising a movable electrical take-off arm contacting a resistance member of a potentiometer and means for moving said take-off arm along said resistance a distance depending on the distance travelled by said projector from one of said two locations, and means for interpolating the error in alignment of the track at the location of the projector on the basis of the recorded amounts of error and the recorded location of said projector, wherein, when said projector travels over track yet to be aligned, said projector traces a path of movement generally parallel to said correct line, whereby in operation said projector is moved over track yet to be aligned and projects a reference beam to said receiver, the position of said piece of track is indicated to said receiver by the position of said shadowboard relative to said reference beam, said receiver indicates to said track aligning means the direction in which said track is to be moved in order that said track is correctly aligned, and said track aligning means moves said track in said direction to correctly align said track.

3,922,970
RAILWAY TRANSPORTATION SYSTEM

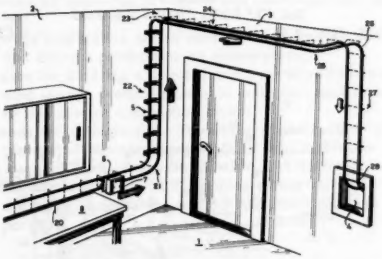
Hendrik Glastra, Enschede, Netherlands, assignor to N.V. Maatschappij voor Industriele Research en Ontwikkeling, Enschede, Netherlands

Filed Apr. 14, 1972, Ser. No. 244,265

Claims priority, application Netherlands, Apr. 15, 1971, 7105013

Int. Cl.[2] B61B *3/02, 13/02;* **B61C** *11/04, 13/04*

U.S. Cl. 104—91 **8 Claims**



1. A transportation apparatus comprising at least one pair of spaced apart, cylindrical, elongated elements defining at least one track, clips interconnecting said elements together in spaced-apart relationship, a carriage guided on said elements and being located therebetween, travelling pulley-type wheels on said carriage also lying between said elements and being in rolling contact with the opposing and inwardly facing portions of said elements, a driving wheel resiliently supported on said carriage and lying in the plane of said travelling wheels, said driving wheel having spaced friction means thereon in rolling contact with one of said elements, and a motor operatively connected to said carriage through reduction gearing for driving said drive wheel.

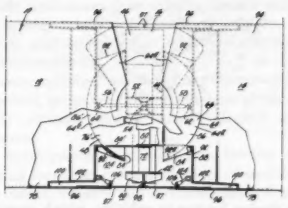
3,922,971
ARTICULATED RAILWAY VEHICLE CONNECTING PASSAGE

Max Maroshick, Glen Mills, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed May 9, 1974, Ser. No. 447,718

Int. Cl.[2] B61D *17/14, 17/20;* **B61F** *3/12, 5/16*

U.S. Cl. 105—4 R **20 Claims**



1. An articulated rail vehicle comprising a pair of cars, a common truck supporting the juxtaposed ends of said cars, a joint on said truck connecting said cars, said joint comprising a tunnel assembly defining an enclosed passage between said car ends, said tunnel assembly including telescoping inner and outer hollow tunnel shell members, connecting means for connecting said tunnel shell members to said truck and including means to enable said tunnel shell members to pivot with respect to said truck about a horizontal transverse axis, and arcuate sealing surfaces on said tunnel shell members engaging arcuate sealing surfaces on said car ends in sliding relation to accommodate transverse angular movement of said cars with respect to said truck and joint.

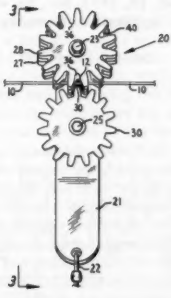
3,922,972
TROLLEY DEVICE

Norman E. Junes, Rte. Box 148, Astoria, Oreg. 97103

Filed Aug. 26, 1974, Ser. No. 500,596

Int. Cl.[2] B61B *3/00*

U.S. Cl. 105—153 **8 Claims**

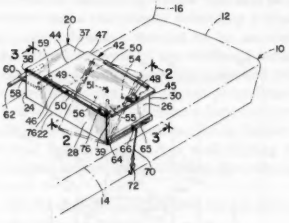


6. A trolley for use on an overhead trolley wire comprising a body member, and a pair of bevel gears on opposite sides of said body member having teeth arranged to mesh together above the trolley wire and roll on the trolley wire to support the trolley, said teeth having spaces therebetween to receive guy wires supporting said trolley wire.

3,922,973
AUTO DESK

Hulan D. Sturgeon, Indianapolis, Ind., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 11, 1974, Ser. No. 450,099
Int. Cl.[2] A47B *23/00, 85/00*
U.S. Cl. 108—26 8 Claims

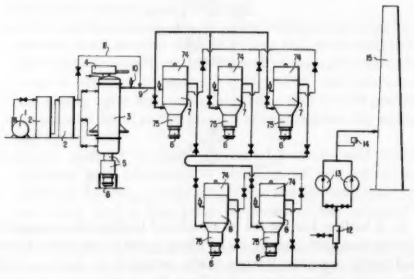


1. A desk device for use in vehicles, which comprises:
a. a main housing having a chamber formed therein;
b. a cover lid hingably mounted onto said main housing;
c. a support plate having channel edges mounted on said cover lid;
d. a clipboard slidably engaged in said channel edges of said support plate allowing said clipboard to be affixed in any desired longitudinal position on said support plate;
e. a pivot swivel carried by said support plate and extending through an opening in said cover lid for angular rotation of said support plate and said clipboard therewith, about said pivot swivel for rotation of said clipboard from any position to any other desired position;
f. angle locking pins carried by said support plate for extending through any one of a plurality of locating holes formed through said cover lid, for releasably retaining said clipboard and said support plate in any desired angular rotated position; and
g. means for securing said desk device to a vehicle seat portion.

3,922,974
METHOD AND DEVICE FOR INCINERATING RADIOACTIVE WASTES AND PREPARING BURNABLE WASTES FOR NON-POLLUTING STORAGE

Wilhelm Hempelmann, Nordring, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Oct. 18, 1973, Ser. No. 407,670
Claims priority, application Germany, Oct. 18, 1972, 2251007
Int. Cl. F23g *7/00*
U.S. Cl. 110—8 R 18 Claims

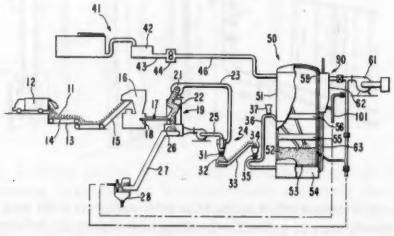


1. An apparatus for incinerating radioactive wastes and preparing combustible radioactive wastes for non-polluting storage, comprising in combination:
a. a grateless furnace being formed of vertically adjoining top, center and bottom sections each defining an inner space, said furnace having a charging end in said top section and a discharge end in said bottom section;
b. a movable damper means positioned in said bottom section for closing said discharge end during incineration;
c. a first air inlet conduit communicating with the inner space defined by said center section;
d. a second air inlet conduit merging tangentially with the inner space defined by said bottom section, in the zone of said discharge end; said second air inlet conduit being oriented towards said damper means in a direction opposite to the orientation of said first air inlet conduit;
e. means disposed externally of said furnace for dividing the space surrounding said furnace into an upper external space surrounding said top and center sections and into a lower external space surrounding said bottom section;
f. a flue gas outlet conduit communicating with the inner space defined by center section;
g. a removable solid waste feeding device communicating with said charging end and being supported by said top section;
h. a liquid waste feeding device communicating with said charging end and being supported by said top section;
i. a flue gas filter having an input connected to said flue gas outlet conduit; filter candles; means for replacing the filter candles; a flue gas surge chamber; means for removing ashes from the flue gas surge chamber; and an outlet; and
j. a removable glove box attached to said discharge end of said furnace; said glove box having an inlet provided with a two-part gate for controlling the outflow of solid material from said furnace and an outlet provided with a coarse grate.

3,922,975
METHOD AND APPARATUS FOR FEEDING SOLID WASTE TO A FLUID BED DISPOSAL APPARATUS

Richard G. Reese, Woodside, Calif., assignor to Combustion Power Company, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 247,829, April 26, 1972, Pat. No. 3,818,846. This application June 24, 1974, Ser. No. 482,617
Int. Cl.[2] F23G *7/00;* F23K *3/02*
U.S. Cl. 110—8 F 4 Claims



1. In a waste disposal apparatus for consuming solid waste with minimal residue including a combustion housing, a bed of granular material, means for supporting the bed of granular material within the housing, means for providing combustion air to the bottom of the bed for maintaining the granular material in a fluidized state, and means for separating heavy particles out from a stream of solid waste material and feeding the remaining light particle fraction in a conveying gas stream to the combustion chamber, the improvement comprising:

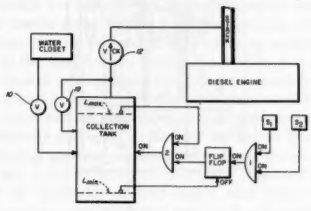
fluid conduit means for carrying solid waste into the combustion housing,
air-lock feed valve means connected to said conduit means for introducing solid waste into said conduit means,
storage means for receiving and storing the separated light particle fraction of solid waste material,
conveyor means for conveying solid waste from said storage means to said air lock feed valve means,
inertial separator means for separating the light particle fraction of the solid waste from the conveying gas stream for delivery to said storage means, and
means for returning the conveying gas separated from said particle fraction to the separation means.

3,922,976

SEWAGE TREATMENT SYSTEM

Robert B. Davis, New Britain, and Alan H. Cornish, Newington, both of Conn., assignors to Koehler-Dayton, Inc., New Britain, Conn.

Filed Nov. 20, 1974, Ser. No. 525,360
Int. Cl.[2] F23G *5/00;* **F01N** *3/02*
U.S. Cl. 110—9 R **5 Claims**



1. A sewage treatment system comprising
a collection tank assembly for collecting sewage including means for macerating the collected sewage, and means for pumping the macerated sewage therefrom,
means for delivering sewage to said collection tank assembly,
sewage combustion means operable at temperatures below and above a predetermined temperature,
means for directing a selected minor portion of the macerated sewage pumped from said collection tank assembly to said sewage combustion means,
means for delivering the remaining major portion of the macerated sewage pumped from said collection tank assembly back into said collection tank assembly, and
means for energizing said pumping means only when the operating temperature exceeds the predetermined temperature.

3,922,977

PLANT HUSBANDRY

Harry F. Lavo, Stamford, Conn., and Charles J. Cante, Bayside, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 385,005, Aug. 2, 1973, abandoned, Division of Ser. No. 298,752, Oct. 18, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,281
Int. Cl.[2] A01C *23/02*
U.S. Cl. 111—1 **2 Claims**

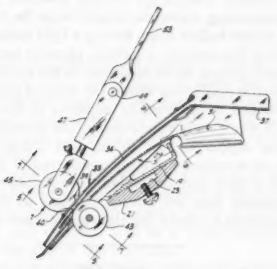
1. A method of treating plant life and soil comprising:
1. providing foam concentrates, containing a concentrated aqueous solution or mixture of foam generating constituents and a plant agent packaged in convenient form for handleability,
2. diluting said solution or mixture with water, and
3. generating foam from the dilute solution or mixture using a foam generator connected to a water supply having a static pressure above 15 psi wherein said concentrate solution or mixture consists essentially of:
a. a foaming agent selected from the group consisting of water soluble salts of lauryl ether sulfate, water soluble salts of lauryl sulfonates, fatty acid esters of sodium isetheonate, and mixtures thereof,
b. a foam enchancer selected from the group consisting of blended alkyl sulfonates, alkylol ether sulfonates, lauric acid monoethanolamide, stearic acid monoethanolamide, lauric acid isopropinolamide, mixtures of lauric acid and myristic acid monoethanolamide, and mixtures thereof,
c. a foam stabilizer selected from the group consisting of glycerol, propylene glycol, ethylene glycol, lauryl alcohol, myristyl alcohol, stearyl alcohol and mixtures thereof,
d. a foam-providing composition fluidity modifier selected from the group consisting of isopropyl alcohol, methanol, ethanol and mixtures thereof, and
e. a plant agent selected from the group consisting of organic fertilizer, inorganic fertilizer, herbicide, insecticide, sterilant, seed, and mixtures thereof.

3,922,978

FOLDING APPARATUS FOR A SEWING MACHINE

John Joseph Smith, North Little Rock, Ark., assignor to Stahl-Urban Company, Brookhaven, Miss.

Filed Oct. 24, 1974, Ser. No. 517,411
Int. Cl.[2] D05B *35/06*
U.S. Cl. 112—147 **3 Claims**



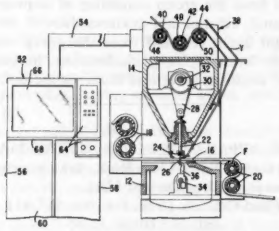
1. Folding apparatus for a sewing machine comprising guide means for guiding a first strip and a second and wider strip to the two needles of a doubleneedle sewing machine, said guide means comprising a base, a tongue over which the strips are fed with the second strip overlying the first and around the side edges of which the margins of the second strip may be folded to underlie the margins of the first strip, said tongue extending over the base and forward from the base, a top plate extending over the tongue and having side edges formed to extend inwardly under the side margins of the tongue for folding the margins of the second strip around the side edges of the tongue, and means on the base for mounting the guide means in position to direct the strips to said needles, wherein the improvement comprises means for feeding the strips forward to the needles, said tongue and top plate having registering openings adjacent their forward end, said feeding means comprising a lower roll mounted below said tongue at said registering openings, an upper roll mounted above the lower roll engageable with the strips at said registering openings, said lower roll extending up between the inwardly extending side edges of the top plate, and means for driving the upper roll said driving means having independent adjustment means for adjusting the speed of the upper roll relative to the speed of feed of the sewing machine so as to relieve the material of

tension which would otherwise be caused by drag of the material in travelling through the guide means, means mounting said upper roll for movement toward and away from said lower roll, and said driving means comprising a speed changer mounted at the rear end of the sewing machine having an input and an output, a drive from the main shaft of the sewing machine to said input, and a universally jointed drive from said output to said movable upper roll.

3,922,979
PATTERN CONTROL FOR TUFTING MACHINE ATTACHMENTS

David Ingham, Blackburn, and Edward C. Lear, Lancaster, both of England, assignors to The Singer Company, New York, N.Y.

Filed Dec. 18, 1974, Ser. No. 534,013
Int. Cl.² D05C *15/26*
U.S. Cl. 112—79 A **4 Claims**

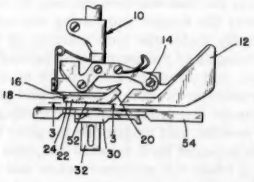


1. A pattern control for tufting machine pattern attachments comprising, a console remote from the tufting machine, an open ended hollow drum having a light transmitting surface mounted in the console, a pattern element having light transmitting and opaque areas mounted on the surface of the drum, a light source positioned within the drum, a plurality of photocells mounted in the console adjacent to the surface of the drum and electrically connected to the pattern attachment, a cradle for supporting the drum, said cradle comprising aa plurality of members drivingly connected to the periphery of the drum at each end, and means for rotating said members in timed relation with the tufting machine so that said pattern element moves between the light source and the photocells.

3,922,980
CHAIN STITCH SEWING MACHINE

James B. Fulp, Summerfield, N.C., assignor to Blue Bell, Inc., Greensboro, N.C.

Filed Dec. 3, 1974, Ser. No. 529,238
Int. Cl.² D05B *27/02*
U.S. Cl. 112—197 **5 Claims**

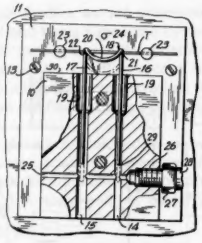


1. Apparatus for sewing machines to form a chain stitch continuously comprising: a presser foot, means on said presser foot for gripping a fabric being sewn traveling along a directed path of travel to prevent thread feedback, a feed dog cooperatively aligned with said presser foot and presser foot gripping means for advancing a fabric being sewn in a directed path of travel, a throat plate positioned between said presser foot and said feed dog, said feed dog having laterally spaced-apart fabric-engaging and upwardly projecting rows, each of said rows having a plurality of serrated teeth, at least one row having a trailing edge foreshortened in length relative to adjacent rows for cooperative alignment with said presser foot fabric gripping means, and said throat plate having means for cooperative alignment and covering the foreshortened row of serrated teeth whereby a continuous chain may be formed during sewing without seam stretching or tensioning.

3,922,981
FLUIDIC THREAD BREAK DETECTION DEVICE AND SYSTEM

Francis H. Hughes, North Troy, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,383
Int. Cl.² D05B *69/36*; B65H *63/02*
U.S. Cl. 112—218 R **6 Claims**



1. A fluidic system for sensing thread break in a sewing system, which comprises

a. a source of fluid under pressure,

b. a position sensor fluidic device connected to said source and having a fluid-discharging sensing port,

c. said position sensor fluidic device having a first operative condition when its sensing port is exposed to relatively low fluid pressure and a second operative condition when said sensing port is exposed to relatively higher fluid pressure,

d. a fluidic thread break detector body connected to said fluidic device,

e. said detector body having a control port connected to the sensing port of said position sensor fluidic device,

f. said detector body having therein a relatively free flow fluid passage connected to the control port,

g. said detector body having a vertical guide passage therein having a preselected bore dimension intersecting with said fluid flow passage,

h. means, including a pair of spaced thread guides located above and on opposite sides of said vertical guide passage, for guiding a thread under sewing tension along a predetermined path above said guide passage,

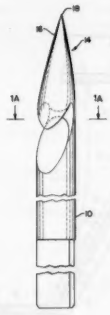
i. a vertically disposed thread detecting wire loosely and slideably received in said vertical guide passage and movable from a first position, supported by a thread under sewing tension and fully retracted from said free flow passage, to a second position, resulting from a thread break, in which at least a portion of the wire is projected through said free flow passage,

j. the presence of said wire in said free flow passage in said second position, resulting in a low efficiency restriction therein and thus in a relatively increased pressure at the sensing port of said position sensor fluidic device, to cause said device to be changed to its second operative condition.

3,922,982
ECCENTRIC-TIP HOOKED NEEDLE FOR HOSIERY LINKING MACHINES

Cesare L. Conti, Via Varese 18, 20121 Milan, Italy

Filed Feb. 4, 1974, Ser. No. 435,887
Int. Cl.² D05B *85/02*
U.S. Cl. 112—222 **1 Claim**

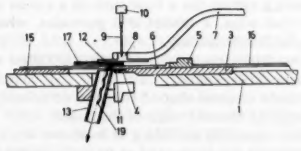


1. A needle for hosiery linking machines and the like comprising a needle shank having a longitudinal axis of symmetry, a tip end portion on said shank defined by tip walls converging to a tip at the longitudinal end of the needle, a hook formed on said tip end portion, said hook being formed by generally U-shaped wall portions having an entrance hook surface and a return hook surface extending generally transversely of said shank whereby said hook is thereby defined as having a hook axis extending generally transversely of said shank, said tip of said tip end portion being eccentrically disposed relative to said axis of symmetry of said shank, said hook being constructed and arranged such that said hook axis makes an angle of from 0° to 45° with the plane containing said axis of symmetry of said shank and said tip.

3,922,983
DEVICE FOR AUTOMATIC CUTTING OF THREAD IN SEWING MACHINES

Helmut Schips, Rorschach, and Rolf Kernbichler, Urnasch, both of Switzerland, assignors to Helmut Schips, Rorschach, Switzerland

Filed May 9, 1974, Ser. No. 467,739
Int. Cl.² D05B *65/02*
U.S. Cl. 112—252 **7 Claims**



1. A device for automatic cutting of thread structures of an article in sewing machines having a sole plate, a stitch plate fastened to said sole plate, a feed plate mounted on said stitch plate having a cutting edge, a needle positioned above said feed plate and a pressure foot fastened to said feed plate, said device comprising:

pneumatic means positioned under said feed plate for automatically sucking in the thread structure, and for automatically looping the thread around said article;

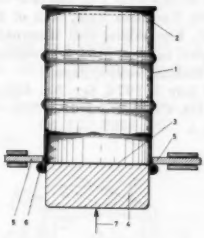
a cutter element mounted at one end of said stitch plate; and

cooperative cutting means mounted on said feed plate for cooperating with said cutter element for cutting the thread structures.

3,922,984
METHOD FOR RECONDITIONING A CONTAINER

Reinder Zuideveld, Farnham, England, and Mattheus Johannes Martinus Coppens, Heide-Kalmthout, Belgium, assignors to Koninklije Emballage Industrie Van Leer B.V., Netherlands

Filed July 3, 1973, Ser. No. 376,192
Claims priority, application Netherlands, July 5, 1972, 7209391
Int. Cl.² B21D *51/00*
U.S. Cl. 113—120 BB **2 Claims**



1. A method of reconditioning a container having end walls connected to a body wall, one of said end walls and said body wall having cylindrical end wall portions with flanged edges which are coiled about each other to form an outwardly directed seam, said seam, in cross-section, being in the form of a spiral, comprising:

a. placing the container with said one end wall on a support means for supporting said one end wall in an axial direction and for supporting the interior of the cylindrical end portion of said one end wall in a radial direction with respect to the axis of the container;

b. moving a tool towards an outer surface of said body wall to completely surround said body wall;

c. relatively moving said tool and support means in opposite directions with respect to each other to completely unroll said seam; and

d. connecting again said body wall and said one end wall with each other to form a seam after reshaping and cleaning of said body wall and said one end wall.

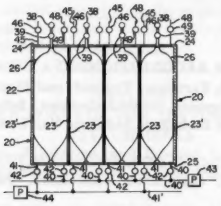
3,922,985
SUBMARINE TANKER FOR TRANSPORTATION OF LIQUID CARGO

Ferris F. Hamilton, 320 High St., Denver, Colo. 80218

Continuation-in-part of Ser. No. 3,307, Jan. 16, 1970, abandoned. This application Oct. 14, 1971, Ser. No. 189,302
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 R **23 Claims**

1. In a cargo vessel, a plurality of storage cells for liquid cargo arranged in mutually reinforcing relation constituting a structural part of the vessel, each cell comprising an outer rigid enclosure at least partially filled with ballast, an inner expansible container secured within each outer enclosure including means for introducing and removing liquid cargo into and from said container, each said storage cell including

means for introducing and removing a gaseous fluid into and from the upper end of each said enclosure and means for



admitting and removing sea water into and from the lower end of each said enclosure.

3,922,986

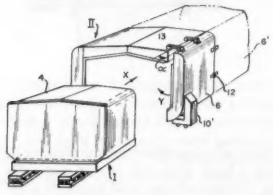
METHOD FOR BUILDING LIQUEFIED-GAS-CARRIER

Kunio Minamizaki; Yasuhiko Yagi, both of Yokohama; Kensuke Murakami, Kamakura, and Hisayuki Kurose, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 2, 1974, Ser. No. 485,082

Int. Cl.² B63B *3/02, 25/16*

U.S. Cl. 114—74 A **3 Claims**



1. A method for building a liquefied-gas-carrier wherein assemblying an upper hull subassembly including a side plating block at a predetermined place on a shipway, inserting a lower hull subassembly having a tank mounted thereupon into said upper hull subassembly, joining said lower hull subassembly to said upper hull subassembly, thereby assemblying a unit tank section, and joining a plurality of unit tank sections to thereby build a ship, wherein said side plating block of said upper hull subassembly is temporarily held in position displaced outwardly from its normal position and is returned to its normal position after said lower hull subassembly is inserted into said upper hull subassembly.

3,922,987

LIQUEFIED GAS TANKER CONSTRUCTION USING STIFFENER MEMBERS

Edmund George Tornay, New York, N.Y., assignor to Conch International Methane Limited, Nassau, Bahamas

Continuation of Ser. No. 384,123, July 30, 1973, abandoned. This application Nov. 14, 1974, Ser. No. 523,685

Claims priority, application United Kingdom, Aug. 2, 1972, 36011/72

Int. Cl.² B63B *25/16*

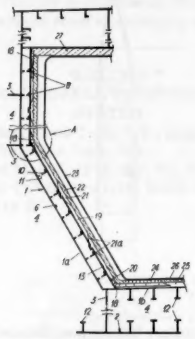
U.S. Cl. 114—74 A **4 Claims**

1. a. In a tanker ship for over-water transportation of cold liquids having a metallic double hull,

b. the inner hull of said double hull defining at least one prismatic cargo hold lined with a thermal insulation material, for housing a tank for the cold liquid cargo,

c. the improvement comprising longitudinally extending horizontal metal plate stiffener members integrally fixed at one edge of the plate to the entire length of the vertically extending walls of the cargo hold at those faces facing inwardly of the cargo hold and of sufficient strength to substantially stiffen and strengthen said walls along their entire length, said stiffener members comprising metal strips extending inwardly toward said tank,

d. said lining of thermal insulation being supported at the other edges of the stiffener members so as to be spaced from and generally parallel to said faces of the cargo hold,



e. said stiffener members having spaced-apart apertures in said metal strips whereby, in operation of the tanker, any water leaking into the space between said vertically extending wall and the thermal insulating lining drains freely through said apertures to the bottom of the cargo hold for removal.

3,922,988

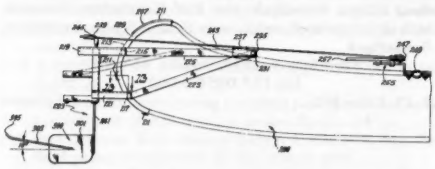
STEERING SYSTEM FOR CANOES AND THE LIKE

Dolphus D. Caton, 149 Beebe Ave., and John R. Ralph, 180 College Park Drive, Apt. B-9, both of Elyria, Ohio 44035

Division of Ser. No. 332,674, Feb. 15, 1973, Pat. No. 3,844,243. This application Jan. 24, 1974, Ser. No. 436,157

Int. Cl.² B63H *25/02*

U.S. Cl. 114—165 **4 Claims**



1. A steering system for a boat such as a canoe or the like having an end edge, a thwart and gunwales, which system comprises, in combination:

a. a substantially rectangular frame supported across the gunwales of the canoe;

b. an arcuate channel-shaped sling for detachably securing the frame to the end edge of the canoe;

c. a rudder assembly including at least one sleeve;

d. a horizontal bar supported at its ends by the frame and journaled within the sleeve for pivotally supporting the rudder assembly between a downward operative position and an upward inoperative position;

e. latching means associated with the frame for detachably securing the horizontal bar thereto and preventing accidental removal of the bar;

f. resilient means for biasing the rudder assembly in the downward operative position; and

g. control means operatively connected to the rudder assembly for steering the canoe.

3,922,989

HYDROPHONE DROGUE

James F. McEachern, Hatboro, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1974, Ser. No. 520,703
Int. Cl.² B63B 21/48
U.S. Cl. 114—209 2 Claims

1. A non-fouling deployable sonobuoy drogue system suitable for placement in a cannister, comprising, in combination:
a float;
a hydrophone;
a flexible rectangular sheet having two linear springs contiguously attached along their lengths to respective ones of opposed edges of said sheet;
said sheet being folded in half between said opposed edges to form an intermediate edge with said springs coinciding with each other, and being furled about said intermediate edge to form an elongated spiral roll with the opposed edges exposed and operatively connected to said float and said hydrophone, respectively; and
said roll being folded in half along its length against the force of said springs to form distal sides slidably receivable within the cannister;
whereby said roll unfolds under the force of said springs when deployed from the cannister, and then unfurls under tension of said hydrophone.

3,922,990

METHOD AND APPARATUS FOR RAISING AND RETRIEVING A BOAT ANCHOR

Emile Menard, Jr., 5647 SE. Dreifshill, Milwaukie, Oreg. 97123

Filed Aug. 15, 1974, Ser. No. 497,574
Int. Cl.² B63B 21/24
U.S. Cl. 114—221 R 7 Claims

1. An anchor raising device, comprising
a generally cylindrical watertight container, said container having a closed bottom and a dished top;
tubular sleeve means disposed generally axially within said container and extending through said container from said bottom to said top, said sleeve means being adapted to pass an anchor line therethrough; and
releasable anchor line restraining means disposed within said sleeve means, said restraining means being adapted to restrain movement of said anchor line with respect to said sleeve means in the direction of said container bottom, said restraining means being adapted to permit

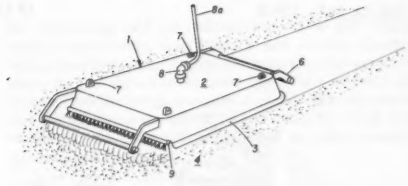
movement of said line with respect to said sleeve means in the direction of said container top.

3,922,991

APPARATUS FOR CLEANING METALLIC SURFACES

John W. Woods, 2108 Country Club Road, Duncan, Okla. 73533

Filed June 25, 1973, Ser. No. 373,492
Int. Cl.² B60S 3/02
U.S. Cl. 114—222 18 Claims



17. Apparatus for cleaning a metallic surface, which comprises:
a. body means;
b. magnetic surface gripping means, attached to said body means and arranged in close proximity to the metallic surface, for magnetically holding said body means adjacent the metallic surface;
c. a plurality of drive means interposed between said body means and the metallic surface for propelling said body means along said metallic surface; and
d. water jetting means, attached to said body means, for emitting a flat, angular high pressure spray of fluid against the metallic surface, wherein said water jetting means includes at least one diverter-lip nozzle.

3,922,992

SINGLE POINT VESSEL MOORING SYSTEM

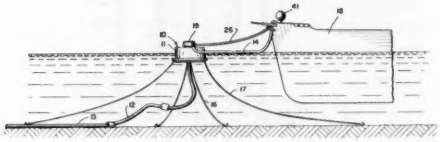
James P. Wilbourn, New Orleans, La., assignor to Texaco Inc., New York, N.Y.

Filed May 29, 1974, Ser. No. 474,281
Int. Cl.² B63B 21/00
U.S. Cl. 114—230 10 Claims

1. System for engaging a vessel floating at the water's surface to a mooring positioned in a body of water, said mooring including a connecting hawser having one end thereof depending from the mooring, and being of sufficient length to position the hawser other end a distance from the mooring,
a messenger line depending from said hawser other end and being supportably elevated to a substantially upright position above the water's surface,

a catch mechanism depending from said vessel to engage and retain said messenger line as the vessel moves into contact therewith,

said catch mechanism including at least two outstanding arms operably carried on the vessel emanating from a



common point on said vessel and positioned outwardly of the point to define an area between said arms which converges toward the vessel,

whereby said hawser other end can be drawn onto and connected to said vessel for restraining further movement of the latter.

3,922,993

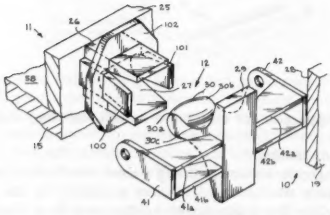
FLEXIBLE COUPLED ARTICULATED VESSEL

Robert A. Bludworth, P.O. Box 12424, Houston, Tex. 77017

Filed Oct. 31, 1973, Ser. No. 411,232

Int. Cl.[2] B63B *21/00*

U.S. Cl. 114—235 R **19 Claims**



1. A marine transportation combination comprising a first vessel having a bow portion and sides, and a second vessel having a notch at one end, said notch having a pair of oppositely disposed wings, coupling means coupling said bow portion of said first vessel to said second vessel at generally the apex of said notch when said first vessel is received in the notch of said second vessel between said wings, said coupling means preventing substantial relative bobbing of said first and second vessels while permitting vertical pivoting of said first and second vessels about said coupling means, said coupling means defining interengaging formations respectively projecting as to one and receiving as to the other of said first and second vessels in a direction generally parallel to the longitudinal axes of said first and second vessels, said formations being engaged by relative forward movement of said first vessel to said second vessel and disengaged by relative rearward movement of said first vessel to said second vessel, and means disposed between opposite sides of said first vessel and the wings of said notch and closely adjacent the rearwardmost portion of said wings for preventing substantial relative yawing and rolling of said first and second vessels while permitting said vertical pivoting.

3,922,994

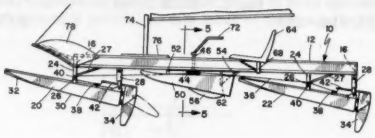
TWIN-HULLED OUTRIGGER SAILBOAT

Ellis R. De Long, 8050 El Capitan, La Mesa, Calif. 92041

Filed May 31, 1974, Ser. No. 475,206

Int. Cl.[2] B63B *1/22*

U.S. Cl. 114—66.5 R **6 Claims**



1. A twin hulled outrigger sailboat comprising:

a. an elongated body;

b. a forward water-contacting laterally centralized substantially longitudinally extended hull member mounted in substantial vertical alignment with and beneath a forward portion of said body;

c. an after water-contacting substantially longitudinally extended hull member mounted in substantial vertical alignment with and beneath a rear portion of said body and being substantially longitudinally aligned with and located in substantially the same horizontal plane as said forward hull member;

d. a pair of outrigger pontoons mounted independently of said forward and after hull members and mounted to opposite sides of said body in spaced relation thereto.

3,922,995

DUAL STATION ROTARY CABLE STEERING SYSTEM

Raymond A. Kroll, Kenosha, Wis., and Donald K. Sullivan, Lake Zurich, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 15, 1974, Ser. No. 460,793

Int. Cl.[2] B63H *21/26*

U.S. Cl. 115—18 R **12 Claims**

1. A steering system comprising a marine propulsion device including a steerable part and a rotatable member connected to said steerable part and effective to cause steering movement of said part upon rotation of said member, a helm housing including a rotatable steering shaft, a first flexible cable including an outer sheath and a rotatable inner core, a first gear box including a housing connected to said outer sheath and to said marine propulsion device, said housing including therein a rotatably mounted gear coupled to said rotatable member for common rotation therewith, said housing also including therein a rotatably mounted pinion coupled to said inner core for common rotation therewith and in mesh with said gear, and a second gear box connected to said outer sheath and to said helm housing and including a rotatably mounted gear coupled to said steering shaft for common rotation therewith and a rotatably mounted pinion coupled to

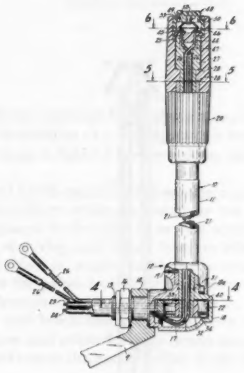
said inner core for common rotation therewith and in mesh with said gear in said second gear box.

3,922,996

STEERING APPARATUS FOR OUTBOARD MOTORS

James A. Meyer, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 29, 1974, Ser. No. 501,498
Int. Cl.[2] B63H *21/26;* G05G *11/00, 1/08;* F02B *77/00*
U.S. Cl. 115—18 R 14 Claims



1. A steering handle assembly for outboard motors, comprising an angled tubular mounting means having offset leg portions joined by a common portion, one of said leg portions including a bearing means for rotatable mounting thereof, a tubular shaft means adapted to be rotatively mounted in the second of the offset leg portions of the mounting means, a throttle control having a throttle positioning means extended through said first offset leg portion and a coupler affixed to the inner end of said tubular shaft within said tubular mounting means, an outer handle grip portion secured to the shaft portion, a switch means located within said handle grip portion, leads extended through said tubular shaft and the first and second leg portions of the mounting means for connection to said motor, an operator in said grip portion for operation of said switch means.

3,922,997

MARINE POWER TRANSMISSION SYSTEM

James J. Jameson, Coffeyville, Kans., assignor to Gardner-Denver Company, Dallas, Tex.

Filed Apr. 17, 1974, Ser. No. 461,674
Int. Cl.[2] B63H *5/08;* F16H *37/06*
U.S. Cl. 115—37 15 Claims

1. In a power transmission system for a boat including a main propulsion engine, a pair of spaced apart propeller shafts, and a propeller mounted on each of said propeller shafts, a transmission unit comprising:

a housing;

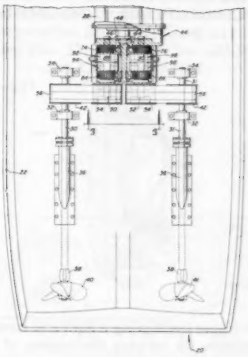
an input shaft mounted on said housing, said input shaft including means for drivingly coupling said engine to said input shaft;

first and second input gears connected to said input shaft to be driven thereby;

idler gear means meshed with said second input gear;

a pair of output shafts mounted on said housing and means drivingly connecting said output shafts to respective ones of said propeller shafts; and,

a forward drive gear rotatably mounted on one of said output shafts and meshed with said first input gear, and a forward drive gear rotatably mounted on said other output shaft and meshed with said idler gear means; and, forward and reverse clutches associated with each of said output shafts for drivingly connecting said input shaft to said output shafts, said forward clutches being disposed



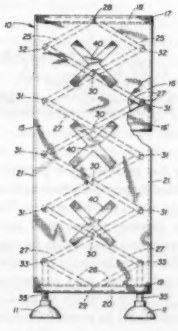
for connecting said forward drive gears to said output shafts, respectively, said forward and reverse clutches being selectively fully engageable whereby said propeller shafts may be driven at the same speed, said forward and reverse clutches being operable at a controlled slip condition for changing the speed of one propeller shaft with respect to the other propeller shaft to effect turning movements of said boat.

3,922,998

WARNING DEVICE FOR STALLED VEHICLES

Sam H. May, 8888 W. Jewell Ave., Lakewood, Colo. 80226

Filed June 24, 1974, Ser. No. 482,276
Int. Cl.[2] B60Q *1/52*
U.S. Cl. 116—40 5 Claims



1. A warning device for stalled vehicles comprising

a. a lazy-tongs type frame expansible for use as a signal material support,

b. signal means made of flexible material attached to the upper and lower ends of the frame, and overlying one face of the frame,

c. an extra length of said flexible material depending from the upper edge of said signal means material on the other face of the frame, and

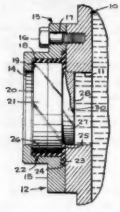
d. mounting means connected to the lower end of the frame for mounting the warning device on the roof of a vehicle.

3,922,999

SIGHT GLASS WITH WEAR INDICATING DEVICE

Charles E. Meginnis, 529 1/2 Nancy St., Charleston, W. Va. 25302

Filed Nov. 2, 1973, Ser. No. 412,255
Int. Cl.² G01D 13/00, 11/26; G01N 31/00
U.S. Cl. 116—114 Q 10 Claims



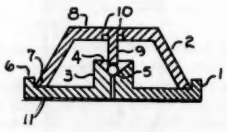
1. In an enclosure containing a fluid and having an opening therein, a structure for viewing the interior of said enclosure conprising a sight glass mounted on said enclosure across such opening therein providing a surface exposed to the interior of said enclosure, said sight glass including means for detecting wear of said exposed surface consisting of nontransparent means preselected dimemsions inserted in said exposed surface of said sight glass on a line of sight therethrough, said sight glass, which when worn away either by physical or chemical action of said fluid, will cause said wear detecting means to indicate that the exposed surface of said sight glass has worn away a predetermined amount.

3,923,000

OMNI DIRECTIONAL TELL TALE TILT INDICATOR

Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Inc., Erie, Pa.

Filed July 15, 1974, Ser. No. 488,654
Int. Cl.² G01C 9/10
U.S. Cl. 116—124 R 11 Claims



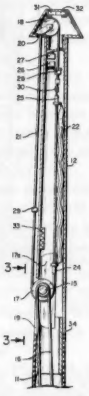
1. An indicator for providing a positive indication that an object has been tilted beyond a predetermined angle, comprising a hollow body for attachment in fixed relation to said object, said body having a top wall and an upright recess having a vertical axis and side walls inclined to the horizontal around said axis flaring outwardly and upwardly and terminating in a rim spaced below and presented to said top wall, indicating means held by gravity in said recess, the depth of the recess being sufficient to prevent bouncing of said indicating means out of the recess by vibration and shock during shipment, said indicating means moving out of said recess when the device is tilted from the vertical through an angle exceeding the inclination to the horizontal of said side walls, and said body having a space around said side walls and below said rim for receiving said indicating means and for preventing movement of the indicating means into the recess upon return of the recess to the upright or vertical position, and a pin connected to said top wall for holding the indicating means in the recess until the pin in removed.

3,923,001

FLAG POLE

Robert M. Murdock, 711 Adelaide Place, Santa Monica, Calif. 90402

Filed Dec. 30, 1974, Ser. No. 537,360
Int. Cl.² G09F 17/00
U.S. Cl. 116—173 6 Claims



1. A flag comprising, in combination:

a. lower and upper tubes;

b. means for coupling said tubes together to provide a flag pole, said means permitting disassembly of the tubes for easy transportation;

c. a reversible motor in the lower tube;

d. a drum secured adjacent to the upper end of the lower tube so as to be accessible when the tubes are separated;

e. a lower endless cable running within said lower tube coupling said motor to said drum to rotate the same when the motor is energized;

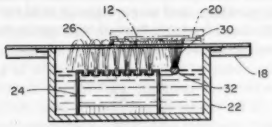
f. a central pulley secured coaxially to said drum;

g. an upper pulley secured adjacent to the upper end of said upper tube, the upper tube having openings at its lower and upper ends juxtaposed respectively to said central and upper pulleys;

h. an uoper endless cable passing from said central pulley up through said upper tube and out the upper opening and down adjacent to the exterior of the upper tube and thence into the lower opening to the central pulley so that rotation of the central pulley by the drum moves said upper endless cable; and,

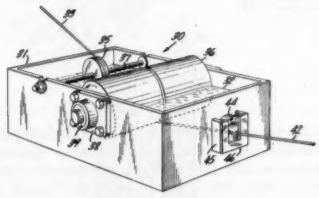
i. a flag secured to the exterior portion of said upper endless cable whereby energization of said motor in one direction rotates the drum and central pulley to thereby retract said flag into said lower opening and up completely within said upper tube whereby said flag is protected from the elements, energization of said motor in an opposite direction causing said upper endless cable to move in an opposite direction to thereby pull said flag out through said lower opening and up along the exterior of said upper tube to an extended flying position.

3,923,002
SOLDERING MACHINE ACCESSORY
Louis Vanyi, 246 Crestwood Ave., Ventura, Calif. 93003
Filed Aug. 24, 1973, Ser. No. 391,192
Int. Cl.² B05C *11/105*
U.S. Cl. 118—110 5 Claims



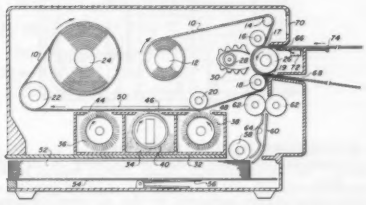
1. In a soldering machine for applying a coating of solder to the conductive portions of a printed circuit board by passing the board through a bath of molten solder, the improvement comprising:
a wire metal brush capable of removing solder from a surface by capillary action mounted on the soldering machine adjacent to the bath of molten solder;
means for removing said brush from an idle position to a ready position in which the brush contacts the liquid solder on the printed circuit board immediately after it passes through the molten solder bath; in said ready position said brush being disposed to withdraw excess solder from said printed circuit board solely by capillary action and return the excess solder to the bath of molten solder.

3,923,003
PRODUCTION OF FLOODED MULTISTRAND CABLE
Danny P. Carden, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.
Filed May 6, 1974, Ser. No. 466,926
Int. Cl.² B05C *11/115, 11/10, 11/02*
U.S. Cl. 118—405 5 Claims



1. Apparatus for applying a viscous coating of predetermined thickness on an advancing flexible strand comprising a housing for containing a viscous coating compound, said housing having side walls, end walls and a bottom, means for supplying a flexible strand for entry into said housing, means for taking up the strand after exiting said housing, means for guiding the strand downwardly beneath the surface of the coating compound in said housing, through the coating compound and outwardly through an exit opening in one wall of said housing disposed beneath the surface of the compound, forming means mounted concentrically with said exit opening for forming the coating compound into a strand coating as the advancing strand exits from said housing, and means facilitating ready removal and replacement of said forming means from its mounting whereby said forming means is selectively interchangeable with alternate ones of said forming means consonant with the diameter of the strand, the viscosity of the coating compound and the predetermined thickness of the coating.

3,923,004
DEVELOPMENT AND CLEANING APPARATUS FOR REVERSE PATH MACHINE
Roger H. Eichorn, deceased, late of Webster, N.Y., and Lincoln First Bank of Rochester, executor, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 27, 1973, Ser. No. 428,975
Int. Cl.² G03G *13/00*
U.S. Cl. 118—637 6 Claims



1. A copier comprising the combination of
a member having an imaging surface for carrying latent images;
reversible means for moving said member first in one direction and then in the opposite direction along a predetermined path;
development means positioned adjacent said path for applying image developing toner particles to said imaging surface as said member is moving in said one direction and in said opposite direction;
first cleaning means positioned adjacent said path on one side of said development means for removing toner particles from background areas of said imaging surface as said member is moving in said one direction; and
second cleaning means positioned adjacent said path on the other side of said development means for removing toner particles from background areas of said imaging surface as said member is moving in said opposite direction.

3,923,005
ALFALFA-BASED ANIMAL LITTER, INCLUDING STARCH
Raymond J. Fry, Concord, and Michael W. Andreasen, Oakland, both of Calif., assignors to The Clorox Company, Oakland, Calif.
Filed Jan. 25, 1974, Ser. No. 436,740
Int. Cl.² A01K *1/015*
U.S. Cl. 119—1 13 Claims

1. A homogeneous composition useful as an animal litter comprising an admixture of cooked alfalfa and gelatinized starch uniformly distributed one throughout the other to form said homogeneous composition in an expanded form.

3,923,006

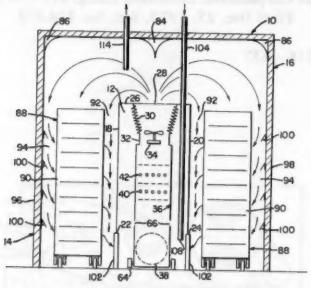
METHOD AND APPARATUS FOR INCUBATING EGGS

James G. Dugan, Littleton, Colo.; Albert S. Hancock, Jr., Orange City, Iowa; Kenneth G. Huston; Bernard L. Rosenberg, both of Denver, Colo.; Shirley M. Smith, Littleton, Colo., and Gene W. Hausske, deceased, late of Palmer Lake, Colo. (by Martha J. Hausske, executrix), assignors to Robbins Incubator Co., Denver, Colo.

Continuation of Ser. No. 219,783, Jan. 21, 1972, Pat. No. 3,829,507. This application Mar. 25, 1974, Ser. No. 454,587

Int. Cl.[2] A01K *41/00*

U.S. Cl. 119—37 19 Claims



4. Incubation apparatus comprising:

a substantially closed chamber defining an air conditioning bay;

chamber means adjacent to the air conditioning bay and defining at least one incubation bay;

an air discharge port at one end of the air conditioning bay and a return air inlet port at the opposite end of the air conditioning bay;

the two ports communicating with opposite ends of the incubation bay to provide a closed circuit repetitive air circulation path through the bays;

an egg rack located in the incubation bay to support a plurality of layers of eggs in position to be enveloped by a current of air flowing through the bay;

and a self-contained air conditioning unit comprising a casing provided with heating means, cooling means, humidifying means, and a blower, all housed completely within the casing;

the casing being located entirely within the air conditioning bay and free standing on the floor thereof and having an air inlet to receive return air from the incubation bay through the return air inlet port and having an air outlet directly connected to the discharge port to force all of the air to pass through the air conditioning unit;

the air outlet having a quick detachable connection to the discharge port, and the air conditioning unit being movably mounted on the floor for rapid total removal and replacement in the air conditioning bay.

3,923,007

EMERGENCY WATER-COOLING SYSTEM FOR A STEAM GENERATOR FOR A PRESSURIZED-WATER COOLANT NUCLEAR REACTOR

Heinz-Jürgen Schröder, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

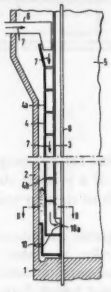
Filed Dec. 14, 1973, Ser. No. 424,652

Claims priority, application Germany, Dec. 19, 1972, 2262152

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 7 Claims

1. A pressurized-water reactor steam generator comprising an upstanding housing having an inside and a lower portion and an upper portion, a tube sheet having a top and a bottom and closing said lower portion, inverted U-shaped tube bundle inside of said housing and having legs with lower ends mounted in said tube sheet via its top, said tube sheet having means for flowing reactor pressurized-water coolant via the tube sheet's bottom through said tube bundle, a shroud radially enclosing said tube bundle, said housing normally receiving a supply of feed water and said shroud being radially spaced from said housing to form a descent space inside of the housing, said shroud and tube bundle having upper portions and lower portions, and an emergency cold water inlet for said housing for introducing a flow of emergency cold water to said housing in the event said supply of feed water fails, said upper



portions of said shroud and tube bundle normally operating at lower temperatures than their said lower portions and said tube sheet; wherein the improvement comprises said emergency cold water inlet being positioned in said upper portion of said housing and said generator having means for directing cold water flowing into said housing through said inlet, so that the cold water initially contacts substantially extended portions of at least one of said upper portions of said shroud and tube bundle before flowing into contact with said lower portions and said tube sheet.

3,923,008

STEAM GENERATORS

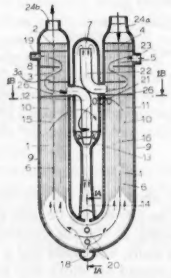
Georg Beckmann, Vienna; Paul Viktor Gilli, Graz; Kurt Fritz, Klosterneuburg, and Josef Lippitsch, Graz, all of Austria, assignors to Waagner-Biro Aktiengesellschaft, Austria

Filed Nov. 15, 1973, Ser. No. 416,272

Claims priority, application Austria, Nov. 16, 1972, 9733/72

Int. Cl. F22b *1/06*

U.S. Cl. 122—34 18 Claims



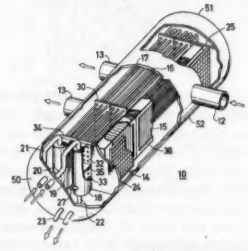
1. In a steam generator, particularly adapted for nuclear power plants, casing means having an inlet end region and an outlet end region respectively having an inlet and outlet for respectively receiving and discharging a primary heating fluid from which heat is to be extracted, said end regions being separate and spaced from each other, inlet and outlet tube plates extending across the interior of said casing means in said inlet and outlet end regions thereof, respectively, and a

plurality of tubes extending along the interior of said casing means, said tubes being connected in parallel between said tube plates and all of said tubes having open ends communicating with said inlet and outlet of said casing means so that the primary heating fluid flows along the interior of said tubes from said inlet end region to said outlet end region of said casing means while a fluid at the exterior of said tubes in said casing means extracts heat from the primary fluid, said casing means having between said tube plates in said inlet end region a superheating chamber one end of which is formed only by said inlet tube plate and in said outlet end region a preheating chamber one end of which is formed only by said outlet tube plate and chambers an evaporating chamber in series with said preheating chamber, said preheating chamber being spaced from and out of communication with said inlet end region and said inlet tube plate as well as the portions of said tubes connected to said inlet tube plate, and said casing means having between said tube plates at said outlet end region an inlet means for introducing water to be received in said preheating chamber and at said inlet end region an outlet means for discharging superheated steam from said superheating chamber, and separator means communicating with said evaporating chamber for receiving a mixture of steam and water therefrom and for separating the steam from the water, said separator means having a steam discharge communicating directly with said superheating chamber for delivering to the latter the steam separated from the water to be superheated only while flowing in said superheating chamber to said outlet means.

3,923,009
MOISTURE SEPARATING AND STEAM REHEATING APPARATUS

Akio Sohma, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1974, Ser. No. 441,798
Claims priority, application Japan, Feb. 12, 1973, 48-16638
Int. Cl. F22b 1/06
U.S. Cl. 122—34 **12 Claims**

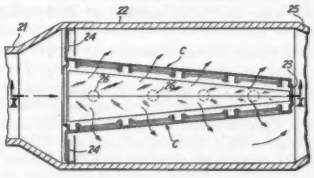


1. A unitary moisture separating and steam reheating apparatus, comprising: an axially elongated tubular shell structure having a pair of oppositely disposed end closure members; a plurality of steam inlets formed on a side wall of the shell structure; a plurality of steam outlets formed on another horizontally opposite side wall of the shell structure; flow rectifying means axially extending substantially from one of said end closure members to the other of said end closure members and being disposed vertically in the vicinity of the inlets for distributing the inlet steam along the length of said shell structure; moisture separator means extending vertically and in parallel to said flow rectifying means along a major portion of the length thereof for removing moisture from the steam; steam reheater means extending vertically and in parallel to said moisture separator means along a major portion of the length therefor for heating the steam; said steam reheater means being disposed between said moisture separator means and said steam outlets, and including a plurality of longitudinally elongated heat exchange tubes; said steam inlets, rectifying means, moisture separator means, steam reheater means, and steam outlets being serially mounted horizontally across a diameter of said tubular shell structure so that the steam flows substantially horizontally and straight from said steam inlets toward said steam outlets to pass through said vertically disposed flow rectifying means, said vertically disposed moisture separator means and said vertically disposed steam reheater means at substantially right angles.

3,923,010
INDUSTRIAL TECHNIQUE

Bernard G. Chlique, Sceaux, France, assignor to Babcock & Wilcox, Limited, London, England

Filed Aug. 20, 1973, Ser. No. 389,771
Claims priority, application France, Aug. 21, 1972, 72.29771
Int. Cl. F22g 5/16
U.S. Cl. 122—483 **9 Claims**

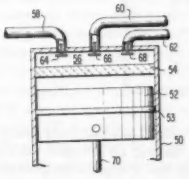


1. Steam drying device forming a screen retaining water droplets for a steam power plant, characterized by several grates placed side by side so that they can be successively crossed by a flow of wet steam, each grate being composed of a network of parallel bars, the bars of one grate being spaced from the interstices of an adjacent grate, said grates each having two parallel bars spaced from each other, said bars having respective longitudinal axes forming a common plane and a metal wire wound on those two bars to form on both sides of the plane common to the longitudinal axes of the two bars two grates of parallel wire strands, the strands of one of the grates being shifted by half a pitch in relation to those of the other, and a discharge spout for supporting at least some of said bars and for discharging water retained by said device.

3,923,011
APPARATUS AND METHOD

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed May 31, 1972, Ser. No. 256,432
Int. Cl.² F02B 75/12
U.S. Cl. 123—1 R **14 Claims**



1. In an internal combustion engine including a cylinder, piston means arranged for reciprocation within the cylinder and cooperating therewith to define a compression zone which is compressed as the piston means moves in a compression stroke from a minimum compression position to a maximum compression position, inlet means for supplying combustion-oxygen-bearing air and carbonaceous fuel to the cylinder, and exhaust means for exhausting combustion product gas from the cylinder, the improvement comprising:

oxidation catalyst means disposed in said cylinder at a location which is within the compression zone when said piston mens is in said maximum compression position,

said catalyst means having gas flow paths therethrough to permit flow therethrough of gases within said cylinder, and

said catalyst means being effective during operation to initiate combustion of a fuel-lean mixture of carbonaceous fuel and air passing in contact therewith at a temperature below 3500°F; with resultant substantially complete combustion to carbon dioxide of said fuel

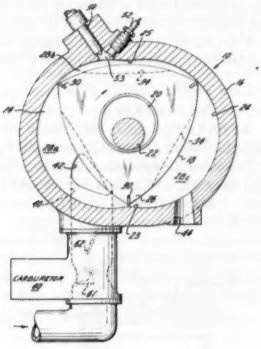
and control means associated with said inlet means for supplying air to said compression zone for compression during each piston compression stroke, and for supplying carbonaceous fuel to the compression zone during each compression stroke at a predetermined time, cooperating with the disposition of the portion of said inlet means carrying said fuel to the cylinder, to effect contact of said fuel with said oxidation catalyst means at a time commencing with the latter portion of each compression stroke,

said control means being adjustable to supply a sufficient total quantity of air, relative to the quantity of said carbonaceous fuel, to give an air:fuel weight ratio of at least about 20:1 and to provide for passage in contact with said oxidation catalyst means of a fuel-lean combustible air-fuel mixture with a theoretical adiabatic flame temperature in the range of from about 1800°F to about 3500°F.

3,923,012
STRATIFIED CHARGE ROTARY ENGINE WITH HIGH AND LOW PRESSURE FUEL SUPPLY

Charles Jones, Hillsdale; Harold D. Lamping, Oakland, and David M. Myers, Upper Saddle River, all of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Dec. 12, 1973, Ser. No. 423,920
Int. Cl.² F02B *53/10*
U.S. Cl. 123—8.09 **3 Claims**



1. A rotary combustion engine comprising:

a. an outer body having an internal cavity, the peripheral surface of which has a multi-lobe profile and also having an air intake passage and a combustion gas exhaust passage;

b. an inner body of generally polygonal profile, mounted for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said peripheral surface to define a plurality of working chambers between said peripheral surface which vary in volume in response to said relative rotation;

c. means for supplying fuel to each working chamber as said chamber is expanding in its intake phase for mixture with air entering through said intake passage to form an initial fuel-air mixture having a fuel-air ratio less than that of a stoichiometric mixture, said fuel supplying means including means operative over substantially the entire operating range of the engine for varying the quantity of fuel supplied to each engine working chamber during its intake phase so as to regulate the engine power output;

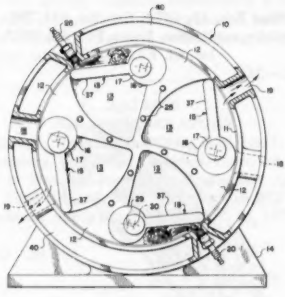
d. a fuel nozzle mounted on said outer body adjacent to a lobe junction of said multi-lobe peripheral surface with its discharge end disposed close to said peripheral surface for discharging a substantially constant quantity of additional fuel directly into each working chamber through a recess in said peripheral surface of the outer body having unrestricted communication with each working chamber, said additional fuel being discharged into each working chamber after the initial fuel-air mixture in said chamber has been substantially compressed and is ready for combustion; and

e. spark plug type ignition means mounted on said outer body with its electrodes disposed in said recess adjacent to the discharge end of said fuel nozzle and operative to ignite fuel as it discharges from said nozzle into the adjacent working chamber whereby the burning of said additional fuel is effective to ignite the initial fuel-air mixture in said working chamber.

3,923,013
ROTARY ENGINE

Herman A. Myers, Masontown, Pa., assignor to Innovate, Inc., Masontown, Pa.

Filed Dec. 14, 1973, Ser. No. 424,757
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.47 **11 Claims**



1. A rotary engine comprising:

A. a main housing having an inner chamber therein, said housing also having fuel intake means, exhaust means, and ignition means communicating with the chamber;

B. a rotor member, rotatable about its longitudinal axis and mounted in the chamber of the main housing, said rotor member having a plurality of combustion chambers formed therein communicating with the chamber of the main housing;

C. a plurality of vane members, each having a cylindrically shaped mounting section for pivotal movement radially inward and outward within a combustion chamber, the pivotal axes of the cylindrical mounting sections aligned in substantially parallel relationships with the longitudinal axis of the rotor member;

D. crank means extending outwardly from opposed ends of each of said cylindrical mounting sections and positioned in parallel, spaced apart relationship to the pivotal axis of each of said mounting sections;

E. track means associated with the main housing adjacent opposed ends of the housing chamber, said means including a trackway having a modified annular shape, varying

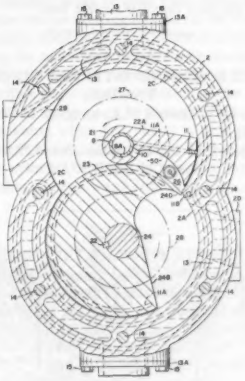
radially inwardly and outwardly a uniform distance with respect to the longitudinal axis of the rotor, said uniform radial variation occuring at a fixed interval around said trackway, said track means having a shape to operably engage and guide the crank means causing simultaneous pivotal movement and identical positioning of all of the vane members within their respective combustion chambers to effect two combustion cycles in each combustion chamber during one revolution of said rotor member, whereby, opposed pairs of vane members perform identical functions in the cycle operation of the engine at the same time; and

F. means associated with the rotor member for transfer of output power therefrom.

3,923,014
INTERNAL COMBUSTION ROTARY ENGINE

Karl Knickerbocker, 400 Baycrest Drive, Venice, Fla. 33595

Filed Apr. 24, 1974, Ser. No. 463,819
Int. Cl.² F02B *53/06*
U.S. Cl. 123—8.49 **5 Claims**

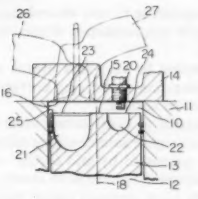


1. In an internal combustion rotary engine, a housing having an internal chamber formed therein, a first and second shaft mounted on said housing, an upper rotor formed on said first shaft and a lower rotor affixed to said second shaft, said first shaft comprising a substantially cylindrical member and said upper rotor comprising an enlarged portion extending outwardly from said substantially cylindrical member, interconnecting means coupled to each one of said shafts to operatively interconnect said rotors for simultaneous rotation in opposite directions, said upper and lower rotors each including convex perimetal sections for sealing engagement with the interior wall of said chamber, said convex perimetal section of said upper rotor being formed on the outer end of said enlarged portion, portions of the perimetal surfaces of said rotors being shaped to permit nesting thereof during rotation and to form a sealed explosion chamber between portions of the perimetals of said rotors at predetermined intervals of rotation, means for injecting compressed fuel into said explosion chamber, means for igniting fuel in said explosion chamber at a predetermined position of said rotors, said housing having an exhaust passage formed therein to permit exhaust of burned fuel from said housing as said rotors rotate to open said explosion chamber following combustion, said first shaft having an axial bore including a rotor fuel flow opening, said rotor fuel flow opening extending between said axial bore and said outer periphery of said cylinder member adjacent the inner portion of said upper rotor, a hollow fuel inlet tube extending into said axial bore and having at least one manifold fuel flow opening formed radially therethrough and in axial alignment with said rotor fuel flow opening, said manifold fuel flow opening and said rotor fuel flow opening disposed to selectively communicate in axial alignment relative to one another during predetermined position of said rotor during each rotation of said rotors, said convex perimetal of said lower rotor engaging said first shaft adjacent said rotor fuel flow opening to close said rotor fuel flow opening and said manifold fuel flow opening from said explosion chamber upon initial forming of said explosion chamber during each rotation of said rotors when said rotor fuel flow opening and said manifold fuel flow opening are partially aligned, said manifold fuel flow opening being oriented relative to said means for igniting the fuel such that fuel flows from said fuel inlet tube through said manifold fuel flow opening and said rotor fuel flow opening to said explosion chamber after said explosion chamber is initially formed and prior to ignition during each rotation of said rotors when said rotor fuel flow opening and said manifold fuel flow opening are axially aligned, said manifold fuel flow opening being oriented relative to said means for igniting the fuel that such that said manifold fuel opening is closed from said explosion chamber by said first shaft means during combustion during each rotation of each said rotors.

3,923,015
COMBUSTION CHAMBER OF SPARK IGNITION INTERNAL COMBUSTION ENGINE

Kosaburo Mukai, Tokyo; Yasufumi Oguri; Yasuo Tatano, both of Yokosuka, and Yoshikazu Kasahara, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed May 3, 1974, Ser. No. 466,905
Claims priority, application Japan, May 4, 1973, 48-50057
Int. Cl.² F02B *19/16*
U.S. Cl. 123—32 B **20 Claims**

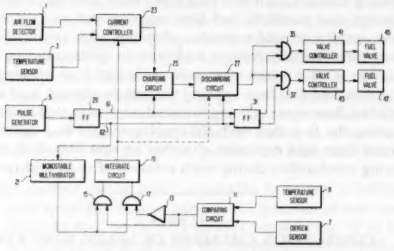


1. In an engine cylinder assembly for a spark ignition internal combustion engine having (a) a cylinder, (b) a piston reciprocatingly slidable in said cylinder and having a flat top surface, (c) a cylinder head sealing an end of said cylinder to define a cylindrical variable volume chamber between a flat surface thereof and said flat piston top surface, (d) a first domeshaped recess to serve as a main combustion chamber having an opening area smaller than 50% of the area of said piston top surface, the location thereof being off center with respect to the longitudinal axis of said cylinder, and (e) a spark plug, said cylindrical chamber being reduced in volume so as to establish a squish causing area when said piston nears the top dead center (f) a second dome-shaped recess smaller in volume than said first recess to serve as an ignition chamber, the location thereof being separate from said first recess, off center with respect to said axis and faced to the spark gap of said spark plug when said piston nears the top dead center, (g) means to supply a combustible airfuel mixture to the cylinder chamber, the improvement comprising the provision of (h) means defining a concavity shallower than said first recess and arranged substantially around the opening of said first recess, the cross-section thereof being varied to be largest at the opening thereof exposed to said cylindrical chamber and smallest at the bottom thereof so that the influence of squish on said first recess is lessened, and (i) said second domeshaped recess having a sharp-edged mouth periphery.

3,923,016
ELECTRONIC FUEL INJECTION APPARATUS FOR A FUEL INJECTION

Yoshikazu Hoshi, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed May 9, 1974, Ser. No. 468,527
Claims priority, application Japan, May 9, 1973, 48-50731
Int. Cl.² F02D 5/02
U.S. Cl. 123—32 EA 10 Claims



1. An electronic control apparatus for a fuel injection system comprising:

first means for generating a first signal representative of the flow of air supplied to an engine cylinder;

second means for generating pulses in response to the engine rotation;

third means for generating a second signal representative of the level of the quantity of oxygen in the engine exhaust gas;

fourth means, responsive to said second signal, for generating a third signal representative of the integration of said second signal;

fifth means, coupled to said first means and said fourth means, for generating a charging current in response to said first and third signals;

sixth means, coupled to said second means and said fifth means, for discharging said charging current in response to said pulses generated by said second means;

seventh means, coupled to said sixth means, for generating a fuel injection valve opening signal in accordance with the time required for said charging current to discharge by said sixth means; and

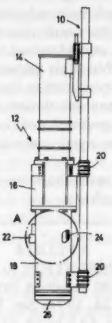
eighth means, responsive to the pulses generated by said second means, for generating a pulse having a predetermined duration, for controlling the operation of said fourth means.

3,923,017
ARRANGEMENT FOR INJECTION NOZZLE AND EXHAUST OPENINGS IN A DIESEL ASSISTED RAM

Rudolf Hennecke, Buoch; Fritz Kommel, Esslingen (Neckar), and Albert Haussmann, Oberboihingen, all of Germany, assignors to Deimag-Maschinenfabrik Reinhold Dornfeld, Esslingen (Neckar), Germany

Continuation of Ser. No. 303,394, Nov. 3, 1972, abandoned.
This application Sept. 5, 1974, Ser. No. 503,351
Claims priority, application Germany, Nov. 6, 1971, 2155306
Int. Cl.² F02D 3/00
U.S. Cl. 123—32 R 4 Claims

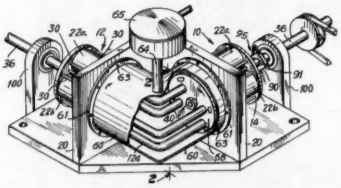
1. A diesel-assisted ram, pile driver or the like having a cylinder in which a percussion piece and a piston adapted to impact thereon are arranged, a metering pump having a fuel injector nozzle for delivery of a stream of fuel on the surface of the percussion piece, said fuel atomizing on impact of said piston on said percussion piece, said cylinder having a plurality of openings for exhaust of gas and for the intake of air being closed and opened by movement of the piston, and being open at least during part of the fuel delivery, said openings lying entirely in that half of the cylinder wall opposite to that in which the fuel injector nozzle lies.



3,923,018
COMPACT ROTATING INTERNAL COMBUSTION ENGINE

Isral J. Markowitz, Closter, N.J., assignor to Stem Industries, Inc., Atlanta, Ga.

Filed Dec. 28, 1973, Ser. No. 429,043
Int. Cl.² F02B 57/06
U.S. Cl. 123—43 A 20 Claims



1. A rotating internal combustion engine operating as a two-stroke cycle engine comprising:

first and second cylinder block supports and blocks, the latter being rotatably connected to the first and second supports, respectively, each cylinder block having cylinder openings, sealably covered by sealing means, extending into the block from the end nearest the other block, the axes of rotation of the two cylinder blocks being transversely aligned at an angle of at least about 90°;

first and second pistons withing the cylinder openings of the first and second cylinder blocks, respectively, and dividing each cylinder opening into forward and rearward chambers; the pistons being slidably and rotatably engaged with their respective cylinder blocks and the central axis of each piston and of each cylinder opening being substantially parallel to each other and to the axis of rotation of its respective cylinder block;

angled crank pins slidably and sealably journaled to the sealing means, each angled crank pin having two ends, one end of each crank pin being secured to one piston in the first cylinder block, and the second end of each crank pin being secured to one piston in the second cylinder block, the angles formed by each of the crank pins being equal to the angle between the axes of rotation of the cylinder blocks;

a driving shaft attached to the far end of the first cylinder block and substantially concentric therewith;

means for feeding a combustible charge into each cylinder opening at predetermined intervals comprising a carbure-

tor; a plenum chamber defined by walls sealably connected to the cylinder block support means surrounding the angled crank pins, and the one-way valve means; and fluid flow conduit means between the carburetor and plenum chamber;

means for igniting the combustible charge within the cylinder openings at predetermined intervals, openings which are fed substantially simultaneously being ignited substantially simultaneously, whereby the ignition of a charge causes reciprocating movement of the piston within each cylinder opening, and the reciprocating movement of each piston is converted into rotating motion of the cylinder block by the action of the angled crank pins interconnecting the two cylinder blocks;

means for discharging combusted combustible charge from each cylinder at pre-determined intervals;

the sealing means comprises a one-way valve for permitting the passage of fluid into the forward chamber, but preventing passage of fluid outwardly from said chamber; the cylinder openings in each of the first and second cylinder blocks containing pistons connected to the same angled crank pin being fed substantially simultaneously; the forward chamber being in fluid flow connection with the combustible charge feeding means via the one-way valve; and the engine comprising in addition transfer port means connecting the rearward chamber with the forward chamber when the piston is in a predetermined position; and an exhaust orifice through the exterior of the cylinder, the exhaust orifice being open to the rearward portion of the cylinder opening when the piston is in a predetermined position; and the ignition means being so juxtaposed within the cylinder opening as to ignite the combustible charge within the rearward chamber.

3,923,019

TWO-CYCLE ENGINE SYSTEM

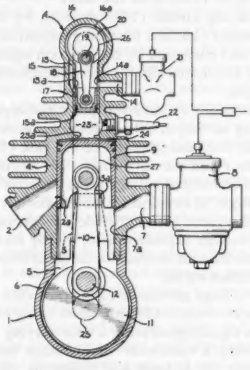
Seiichiro Yamada, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Shizuoka, Japan

Filed Mar. 18, 1974, Ser. No. 452,400

Claims priority, application Japan, Mar. 19, 1973, 48-33635[U]

Int. Cl.[2] F02B *25/12*

U.S. Cl. 123—53 BA 10 Claims



1. A stratified charge, two cycle internal combustion engine assembly having a first and second two cycle engine, each of said two cycle engines having a cylinder, a closed crankcase at one end of said cylinder, a crankshaft rotatably mounted in said crankcase, a piston coupled to said crankshaft for reciprocation along the longitudinal axis of said corresponding cylinder, an inlet port means for admitting an air-fuel mixture into said crankcase when said piston is at a position with said cylinder distal from said crankcase, and a delivery port means controlled by said corresponding piston for delivering said corresponding air-fuel mixture from said corresponding crankcase to each corresponding cylinder when said corresponding piston is disposed in the portion of said corresponding cylinder adjacent to said crankcase, the improvement comprising:

a closed common combustion chamber formed at the ends of said first and second cylinders distal from said first and second crankcases, said common combustion chamber formed to centrifugally segregate said air-fuel mixtures delivered to said common combustion chamber from said first and second two cycle engines;

an ignition means for igniting said air-fuel mixtures delivered to said common combustion chamber to produce an exhaust gas;

an exhaust port means opening within said cylinder of said first two cycle engine for exhausting said exhaust gas from said common combustion chamber and from said cylinder of said first two cycle engine;

wherein said second two cycle engine is adjusted to deliver a fuel rich air-fuel mixture, and said first two cycle engine is adjusted to deliver a fuel lean air-fuel to said common combustion chamber and to a portion of said cylinder of said first two cycle engine wherein said fuel rich and fuel lean air-fuel mixtures are thoroughly combusted and said exhaust gas is substantially free of combustible gas and partially combusted gas.

3,923,020

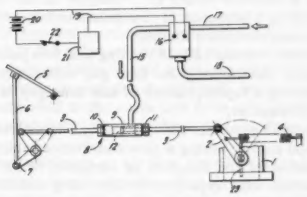
THROTTLE CONTROL DEVICE FOR MOTOR VEHICLES

John E. Gilligan, Stockton, Calif., assignor to Alert Control Company, Stockton, Calif.

Filed Feb. 11, 1974, Ser. No. 441,561

Int. Cl.[2] F02D *11/08*

U.S. Cl. 123—103 C 1 Claim



1. A throttle control device for a motor vehicle having a throttle lever, a spring connected with the throttle lever and yieldably urging the same in a throttle-closing direction, and an operator-actuated throttle rod connected to the throttle lever to move the same in the opposite and throttle-opening direction against the action of the spring; said device comprising a hydraulic pressure-actuated power cylinder interposed in series in the throttle rod, valve-controlled hydraulic pressure conduit means connected to the power cylinder, said conduit means normally delivering, during vehicle operation, hydraulic pressure to the power cylinder to cause contraction thereof to its minimum length whereby to provide undiminished throttle capacity of said rod, and means responsive to the vehicle attaining a predetermined road speed operative in association with said valve-controlled hydraulic pressure conduit means, to cause the latter to relieve the hydraulic pressure from the power cylinder to permit expansion thereof by the spring to its maximum length whereby to diminish the throttle capacity of said rod.

3,923,021

DIGITAL CIRCUIT PROVIDING A TRIGGER SIGNAL TO TRIGGER AN EVENT BASED ON OPERATING FUNCTIONS OF MOVING APPARATUS ELEMENTS, PARTICULARLY TO TRIGGER AN IGNITION PULSE IN AN INTERNAL COMBUSTION ENGINE

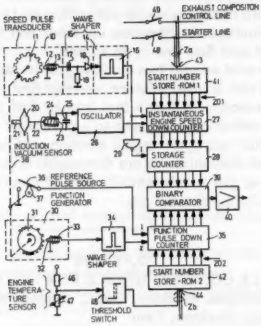
Eberhard Stark, Korntal, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhoehe, Germany

Filed Aug. 12, 1974, Ser. No. 496,651

Claims priority, application Germany, Sept. 14, 1973, 2346333

Int. Cl.² F02P 3/02

U.S. Cl. 123—117 R 27 Claims



1. Digital system to provide a trigger signal to trigger an operating event in an operated device at a time subsequent to a datum instant, which time depends on operating conditions of the device,

characterized by

a. first transducer means (10) coupled to the device and providing a sequence of first pulses representative of an operating condition thereof;

first counter means (27, 28) having said first pulses applied thereto, determining the time gap between pulses, and providing a representation of said time gap in form of a digital number;

b. a function generator (30) providing a second sequence of second pulses, having a time distribution which is representative of the function of variation of an operating condition with respect to the operating condition of said device subsequent to operation with respect to said datum;

second counter means (35) providing a representation of the number of second pulses, derived from said function generator, in the form of a second digital number, arising subsequent to said datum;

c. a digital comparator (39) connected to and comparing the numbers in both said first counter means (27, 28) and said second counter means (35) and providing said trigger signal upon determination of equality of said first and second digital number;

d. a start number storage means (41) connected to at least one of said counter means (27, 28; 35), and providing a predetermined start number to the respective counter means representative of an operating condition of the device; and

e. means (36, 37) coupled to said operated device, providing a datum reference pulse, and providing said pulse at a predetermined operating position of an operating element of said device to form said datum, the load input terminal (a) of said second counter means (35) being controlled by the datum reference pulse from said reference pulse source means.

3,923,022

COMBUSTION ENGINE IGNITION TIMING SYSTEM

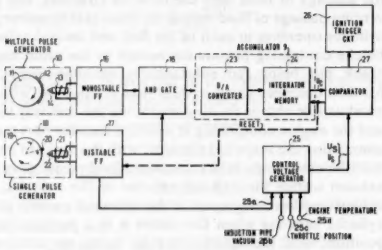
Hermann Scholl, Korntal, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Apr. 17, 1974, Ser. No. 461,527

Claims priority, application Germany, Apr. 23, 1973, 2326187

Int. Cl.² F02P 1/00, 5/04

U.S. Cl. 123—117 R 4 Claims



1. Ignition timing control system for internal combustion engines, comprising:

shaft position transducer means (18) providing a position signal representative of a predetermined angular position of the crankshaft of the engine;

pulse transducer means (10) providing a train of sequential signals upon rotation of the shaft;

a wave-shaping circuit (15) triggered by the pulse transducer means (10) and providing sequential similar pulses;

a gate (16) energized by the position signal connected to pass the sequential signals upon energization by the position signal;

an accumulator (9) having a pulse conversion stage (23) providing an output voltage representative of the number of pulses after energization of the gate (16), and

an integrator and memory stage (24) storing the instantaneous accumulated voltage representative of the instantaneous angle of rotation of the crankshaft after energization of the gate (16) to provide a progressively increasing output voltage representative, at any instant of time, of the instantaneous position of the shaft after occurrence of said position signal;

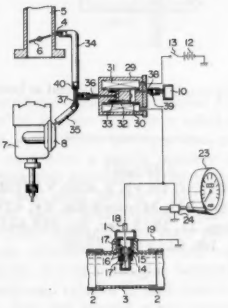
a control voltage generator (25) connected to the position transducer means (18) and, upon being triggered by said position signal, generating a time-varying command voltage having a nonlinear time-voltage relationship, and depending on at least one operating parameter of the engine, representative of a commanded ignition instant with respect to said predetermined angular crankshaft position;

and a comparator (27) comparing the output voltage of the control voltage generator (25) and of the accumulated votage of the accumulator (9) and providing an output indicative of the ignition instant, as commanded by the control voltage generator (25) upon rotation of the crankshaft to the commanded position, as represented by the accumulated signal.

3,923,023
IGNITION TIMING CONTROL DEVICES FOR AUTOMOTIVE VEHICLES

Mikiji Ito, Nagoya; Yoshi Suzuki, Kariya; Kiyohiku Mizuno, Nagoya, and Susumu Urano, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sept. 28, 1973, Ser. No. 401,715
Claims priority, application Japan, Sept. 29, 1972, 47-98455; Oct. 11, 1972, 47-118086[U]
Int. Cl.² F02P 5/08
U.S. Cl. 123—117 A 2 Claims

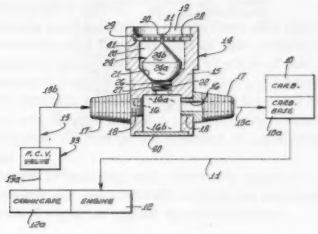


1. In an automotive engine including a hose through which cooling water flows from the engine to a radiator and a vacuum advance mechanism having a carburetor and a distributor including a diaphragm chamber, an ignition control device comprising a thermosensitive switch which is fixed to said hose through which cooling water flows from the engine to said radiator and being adapted to detect the temperature of said cooling water, said thermosensitive switch including two permanent magnets disposed in series, two thermal ferrites of which Curie points are about 60°C and about 100°C, respectively, which are interposed between said permanent magnets, and a reed switch at least partially surrounded by said permanent magnets and thermal ferrites, an electromagnetic valve including a chamber formed therein having an atmospheric port through which said chamber is communicated with the surrounding air and an outlet port; a T-shaped conduit communicating said carburetor and said diaphragm chamber with said outlet port of said electromagnetic valve, said electromagnetic valve further including an electromagnetic coil, a spring mounted in said chamber and a moving core contained in said chamber and biased by said spring; a source of electric power, the terminals of said electromagnetic coil being connected between said source of electric power and said switch wherein when said coil is energized said moving core is displaced to close said atmospheric port; and said device further comprising at least one orifice which is inserted into said T-shaped conduit wherein when said temperature of said water is below about 60°C and above about 100°C said switch is closed to energize said electromagnetic coil to close said atmospheric port and thereby advance said distributor by the air pressure of said carburetor and wherein when the temperature of said water is between about 60°C and 100°C said switch is opened to thereby deenergize said electromagnetic coil so that atmospheric pressure and the pressure of said carburetor are both transmitted to said diaphragm chamber.

3,923,024
AIR METERING VALVE FOR ENGINE AIR INLET SYSTEM

John W. Dabrio, 14533 San Cristobal Drive, La Mirada, Calif. 90638

Filed Mar. 28, 1974, Ser. No. 455,554
Int. Cl.² F02M 25/06
U.S. Cl. 123—119 B 2 Claims



1. In a system for metering gas delivery to the air-fuel mixture stream supplied to an internal combustion engine, said system including a duct to deliver engine crankcase gas flow to said stream, an air metering valve unit comprising

a. a body operatively connectible in series with said duct and providing a through passage to pass the crankcase gas flow through the body,

b. the body also having an air inlet, and

c. control means including a valve element movable in the body in response to relatively decreased suction communicated to the valve unit via said stream to increase air delivery via said inlet to said crankcase gaseous flow, and also movable in response to relatively increased suction communicated to the valve unit from said stream to decrease air delivery via said inlet to said crankcase gaseous flow,

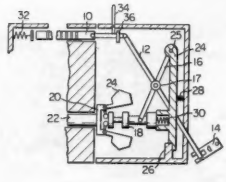
d. said body defining an air flow chamber, there being an annular seat in said chamber, the valve element comprising a stopper movable in the chamber to annularly engage said seat in response to said increased suction communication to said stopper, said chamber including a flow port communicating between said through passage and said stopper, there being a compression spring in said flow port for urging the stopper in a direction away from the seat in response to said relatively decreased suction communication to the stopper via said flow port, the stopper having an annularly convex lower portion to engage the seat, and an upwardly tapering, cone shaped upper portion to be swept by air entering the chamber via said inlet, the chamber extending upright above the level of said through passage, and

e. a perforated plate extending across said inlet and removably carried by said body, there being interfitting guide means on the plate and stopper to guide stopper movement in a vertical direction toward and away form said seat so that said stopper remains substantially centered relative to said seat but is also free to seat in slightly differing horizontal positions, said guide means including a pin projecting upwardly from the apex of said cone shaped upper portion of the stopper and a central bore in the plate slidably receiving the pin.

3,923,025
FUEL INJECTION PUMP GOVERNOR ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

Hirosi Isobe, and Iwao Maruyama, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,468
Claims priority, application Japan, Apr. 20, 1973, 48-44146
Int. Cl.² F02D 1/04
U.S. Cl. 123—140 R 6 Claims



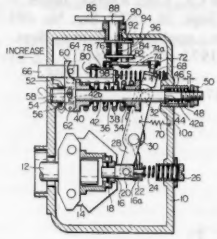
1. A fuel injection pump governor assembly, comprising:
a fuel injection pump control rod movable from a position to provide substantially zero fuel injection volume in a direction to increase the fuel injection volume;
an engine driven centrifugal governor operatively connected to said control rod to urge said control rod toward said position of substantially zero fuel injection volume as a predetermined function of engine speed;
a stopper member manually actuable to move said control rod to said position of substantially zero fuel injection volume;
yieldable means disposed between said centrifugal governor and said control rod and arranged to yield only when said control rod is moved by said stopper member to said position of substantially zero fuel injection volume to prevent breakage of said governor assembly; and
biasing means engagable with said yieldable means when said control rod has moved to a predetermined position in said direction to increase the fuel injection volume;
the stiffness of said biasing means being selected so that further movement of said control in said direction is possible only if the engine speed is below a first predetermined value; and
said yieldable means and said biasing means being arranged so that said yieldable means yields only when said stopper member is actuated to move said control rod to said position of substantially zero fuel injection volume even if said biasing means is in engagement therewith.

3,923,026
DIESEL ENGINE FUEL INJECTION PUMP GOVERNOR

Hachiro Aoki, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,331
Claims priority, application Japan, June 1, 1973, 48-60781
Int. Cl.² F02D 1/04, 1/06
U.S. Cl. 123—140 J 13 Claims

1. A fuel injection pump governor comprising a fuel control rod, flyweights displaceable upon rotation thereof, first linkage means operably connecting said flyweights to said control rod, governor spring means and an idling spring connected to said first linkage means and operable to biasingly oppose displacement of said flyweights upon rotational speed increase of the latter, said first linkage means comprising linkage elements operable to disengage said idling spring from said fly-

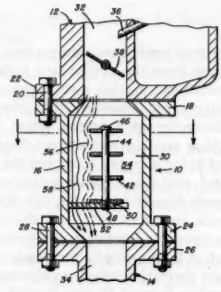


weights when the flyweight rotational speed is below a predetermined value.

3,923,027
FUEL ATOMIZING DEVICE AND VAPORIZER

Henry L. Daniels, Box 223, Munfordville, Ky. 42765

Filed Aug. 21, 1973, Ser. No. 389,643
Int. Cl.² F02M 29/00
U.S. Cl. 123—141 3 Claims

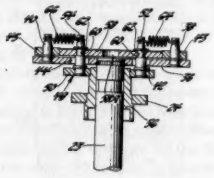


1. In combination with a carburetor supplying a mixture of liquid fuel and air to an intake manifold of an internal combustion engine, a fuel atomizing device comprising a conduit conducting the fuel-air mixture in one direction therethrough from the carburetor to the intake manifold and defining an atomizing zone intermediate the opposite ends of said conduit, said zone including a central longitudinal area bounded by an outer peripheral area extending about said central area and along said zone, and stationary flow deflecting means mounted within said central area and operative to impart lateral inward and outward oscillations to at least portions of the fuel and air in the mixture moving through said outer peripheral area at respectively different amplitudes in response to pressure differential induced flow of said mixture in said one direction, said flow deflecting means including a fixed central mounting stem, and a plurality of axially spaced generally flat discs secured to said stem defining low pressure pockets therebetween within the flow stream of said fuel-air mixture and disposed wholly within said central area.

3,923,028
IGNITION DISTRIBUTOR CENTRIFUGAL ADVANCE MECHANISM

Robert W. Campbell, and Robert E. Young, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 23, 1974, Ser. No. 435,863
Int. Cl.² F02P *1/00*
U.S. Cl. 123—146.5 A **8 Claims**

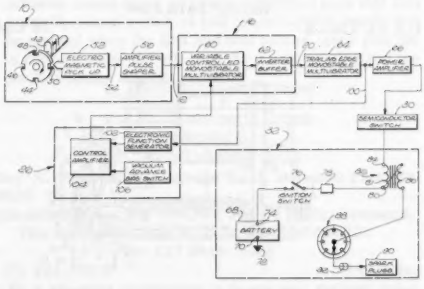


7. A centrifugal advance mechanism for adjusting a timing member of an ignition distributor relative to a driving shaft comprising, a distributor having a base, a shaft rotatably supported by said base, a timing member disposed about said shaft and rotatably adjustable relative thereto, a weight plate secured to said shaft having a pair of pivot pins secured thereto, said weight plate having a pair of openings, a flyweight pivotally supported by each pivot pin, a cam plate having outer contoured wall sections respectively engaging inner surfaces of said flyweights whereby said cam plate is rotatably adjusted relative to said shaft by movement of said flyweights, first and second posts connected to said timing member, means removably connecting said cam plate to said posts, said posts passing respectively through said openings in said weight plate, said posts connected to said cam plate and said timing member at points located on opposite sides of said weight plate whereby said cam plate and timing member are rotatably adjustable together relative to said shaft, and a spring interposed between each post and each pivot pin.

3,923,029
ELECTRONIC IGNITION SYSTEM

Benito Polo, 9446 Borson St., Downey, Calif. 90241

Continuation-in-part of Ser. No. 361,652, May 18, 1973, which is a continuation of Ser. No. 167,900, Aug. 2, 1971. This application Apr. 17, 1974, Ser. No. 461,773
Int. Cl.² F02P *5/04*
U.S. Cl. 123—148 E **8 Claims**



1. An electronic ignition system for internal combustion engines comprising:

A. electromagnetic means for generating a plurality of pulses,

1. said means generating one pulse for each spark plug which will fire during each revolution of a crankshaft in said engine, and

2. the repetition rate of said pulses being directly proportional to engine speed;

B. control means having first and second input terminals and an output terminal for providing a control signal having a duration variable with engine speed thereby to advance the firing of the spark plugs in said engine, said control signal upon termination thereof initiating the firing of a spark plug;

C. an electronic function generator means for automatically generating an electronic signal of predetermined but constant wave form having a characteristic matching the desired spark advance profile of said engine, said electronic signal commencing responsive to termination of said control signal;

D. means connecting said pulses from said electromagnetic means to said first terminal of said control means, said control signal being initiated by each of said pulses;

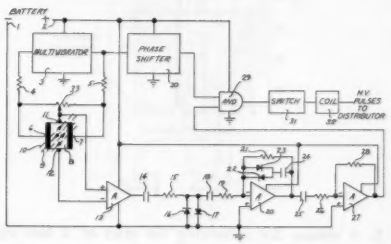
E. capacitive feedback means connected between said output terminal and said second input terminal for terminating said control signal a predetermined fixed time after initiation thereof in the absence of an electronic signal; and

F. means connecting said electronic signal to said second terminal for automatically advancing termination of said control signal as engine speed increases.

3,923,030
PHASE SENSITIVE IGNITION TIMING SYSTEM

Frank Kenneth Luteran, 10 Charles St., Auburn, N.Y. 13021

Filed Sept. 19, 1974, Ser. No. 507,567
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 E **10 Claims**



1. An ignition timing system for an internal combustion engine comprising:

a. an engine having a distributor shaft;

b. a magnetic permeable rotor with a plurality of lobes affixed to the distributor shaft;

c. a magnetic permeable stator with a plurality of poles concentrically positioned about the rotor;

d. energization coils wound on the stator and producing a magnetic field upon energization thereof;

e. electrical current sources means providing energization of the coils in accordance with the ignition timing requirements of the engine;

f. a Hall element attached to a pole piece of said stator and disposed in said magnetic field, said element having control input leads and output signals leads, generating an output signal of the same frequency as the control input signal, phase and amplitude modulated in accordance with the amplitude and direction of the instantaneous value of said magnetic field;

g. signal generator means producing a high frequency signal and connected to the control leads of the Hall element;

h. differential amplifier means connected to the output signal of the Hall element and producing an output signal;

i. amplifier means connected to the output of the differential amplifier and producing an amplitude limited output signal;

j. phase shifter means connected to the signal generator means and producing a high frequency output signal that is phase shifted an amount equal to the phase shift occurring in the differential amplifier and the amplifier;

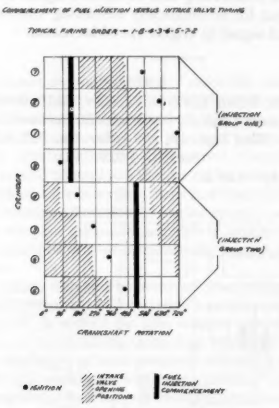
k. an AND gate combining the amplifier output signal and the phase shifter output signal and producing a timing signal when the amplifier and phase shifter signals are in phase;

l. H.V. pulse generating means for producing an ignition pulse when the timing signal is generated.

3,923,031
SYSTEM FOR REORDERING THE FUEL INJECTION SEQUENCE TO FACILITATE STARTING OF AN INTERNAL COMBUSTION ENGINE

Theodore W. Keranen, Pontiac, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 25, 1974, Ser. No. 526,863
Int. Cl.² F02M *51/00, 39/00*
U.S. Cl. 123—179 L **23 Claims**



1. A system for enhancing the start of a fuel injection equipped internal combustion engine, said engine having a plurality of cylinders and an electronic control unit generating in synchronization with the rotation of the engine at least two sequential injection signals indicative of the engine's fuel requirements, each cylinder having an associated intake valve and fuel injector valve, said intake valves periodically opening in synchronization with the rotation of the engine to admit a mixture of fuel and air into the cylinders and each injector valve sequentially injecting fuel for each cylinder in response to one of said sequential injection signals wherein said injection signals are generated at a time relative to the opening of the associated intake valves to commence fuel injection for each cylinder prior to the opening of the associated intake valve, and wherein said engine further includes an electrically actuated starter to crank the engine to effect a start thereof comprising:

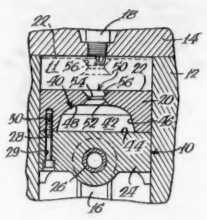
means for generating a start attempt signal indicative of an attempt to start the engine in response to the actuation of the starter; and

means electrically disposed between the electronic control unit and the fuel injector valves, for reordering, in response to said start attempt signal, the sequence in which the injector valves are actuated by the generated injection signals to commence fuel injection for each cylinder when the associated intake valve is open.

3,923,032
CHAMBERED PISTON FOR AN INTERNAL COMBUSTION ENGINE

Karl E. Studenroth, 1609 Euclid Ave., Chicago Heights, Ill. 60411

Filed Apr. 22, 1974, Ser. No. 462,642
Int. Cl.² F02F *3/00, 3/26*
U.S. Cl. 123—193 P **9 Claims**

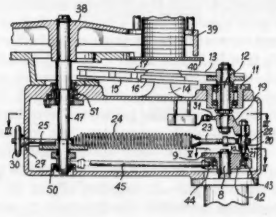


1. In a piston for a four cycle spark ignition internal combustion engine having a spark plug, the piston cooperating with the engine walls to define a combustion chamber of variable volume, the improvement comprising a piston member with a fixed piston area and having a piston chamber formed within said piston member, said piston chamber having a nozzle of an area of generally five or less percent of the piston area exiting through an outer surface of the piston member into said combustion chamber, said piston chamber having an interior of a cross-sectional area at least five times larger than the cross-sectional area of said nozzle, said piston chamber containing substantially all of a combustible mixture introduced into the combustion chamber of the engine and being in communication with said spark plug near the completion of the compression cycle, whereby upon ignition of the combustible mixture in said piston chamber by said spark plug, the gases generated by combustion are discharged from said piston chamber out said nozzle to drive said piston member by jet reaction and after being discharged into said combustion chamber act on said outer surface of said piston to further drive said piston member.

3,923,033
ELECTRICALLY CONTROLLED TARGET THROWING DEVICE

Jean-Michel Laporte, and Jean-Claude Laporte, both of Pont de la Brague, 06600 Antibes, France

Filed July 16, 1974, Ser. No. 489,066
Claims priority, application France, July 17, 1973, 73.26111
Int. Cl.² F41B *3/04*
U.S. Cl. 124—8 **10 Claims**



1. In a device for the throwing of plate-type frangible targets, said device comprising a body which supports a first rotatable shaft having a throwing arm affixed to a first end thereof and a crank mechanism affixed to the second end

thereof, a traction spring, the crank mechanism being coupled to the extendable end of the traction spring and including a crank which extends radially outwardly with respect to the first rotatable shaft, the crank mechanism crank supporting a first crank pin which is driven to extend the spring to store energy for the throwing stroke of the arm, an improved mechanism for controlling the cocking of the throwing arm against the tension of the traction spring comprising:

drive motor means for providing power for the movement of the crank mechanism against the force of the traction spring to place the spring in tension, said motor means including an electric motor and having a rotatable output shaft arranged coaxially with the first rotatable shaft of the throwing device;

means for coupling movement of said drive motor means output shaft to the crank mechanism, said coupling means including a second crank pin connected to and radially offset from said drive motor means output shaft axis by the same radial distance as the first crank pin is offset from the axis of the first rotatable shaft, the first and said second crank pins extending through a common plane so as to be in driving relationship; and

means for controlling the energization of said drive motor means, said energization controlling means interrupting the supply of current of said electric motor when the throwing arm has been moved to the cocked position, said energization controlling means including:

a relay, said relay having a solenoid and including normally open contacts in series with said electric motor;

first relay energization circuit means for completing a current path between said relay solenoid and a current source, said first circuit means including a normally open switch, the closing of said normally open switch permitting current flow through said relay solenoid to energize said relay to close said normally open contacts to thereby energize said electric motor;

second relay energization circuit means for completing a current path between said relay solenoid and a current source, said second circuit means being connected in parallel with said first circuit means and including a normally closed switch, the opening of said normally closed switch when said first circuit means normally open switch is in the open condition de-energizing said relay and said electric motor;

finger means, said finger means extending generally outwardly with respect to the first rotatable shaft of the throwing device and being rotatable therewith so as to engage an actuator means to open said normally closed switch and permit the deenergization of the solenoid; and actuator means for causing opening of said normally closed switch, said switch actuator means being supported on the throwing device body in a position so as to be contacted by said finger means, said finger means and actuator means being relatively positioned such that said normally closed switch of said second circuit means will be opened when the first and said second crank pins are in contact under the effect of the traction spring and the traction spring is under tension.

3,923,034

SLINGSHOT

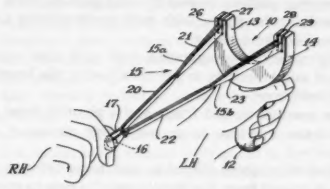
Rodney A. Wolf, 2148 Magnolia Lane, Highland Park, Ill. 60035

Continuation of Ser. No. 269,588, July 7, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,721

Int. Cl.² F41B 7/00

U.S. Cl. 124—20 R **16 Claims**

1. In a slingshot comprising a frame and resilient band means secured thereto, the band means comprising resilient side means and an intermediate missilereceiving portion adapted to retain a missile, the resilient side means being tensioned and then released to fling the missile, the improvement characterized in that the resilient side means are tapered lengthwise substantially along its full length in cross section when untensioned from the connection of the side means to



the frame to the connection to the missile-receiving portion to materially increase the velocity of a missile and the efficiency of the slingshot.

3,923,035

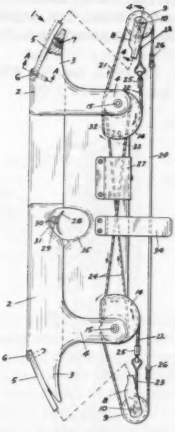
COMPOUND BOW

George H. Trotter, 7107 Janey St., Shreveport, La. 71108

Filed Aug. 20, 1974, Ser. No. 498,970

Int. Cl.² F41B 5/00

U.S. Cl. 124—24 R **1 Claim**



1. A compound bow comprising:

a. a frame;

b. a pair of limbs carried by said frame and adapted to bend when said bow is drawn;

c. a single pulley carried by each of said limbs and positioned at the free end of each of said limbs at the extremities of said limbs;

d. a pair of cams carried by said frame;

e. a first forward tension cable, one end of which is carried by one of said cams while the other end of which extends uninterrupted to said pulley on one of said limbs, and a second forward tension cable, one end of which is carried by the other of said cams while the other end of which extends uninterrupted to the other of said pulleys;

f. a bowstring, each end of which is respectively attached to the ends of said forward tension cables, whereby when said bowstring is drawn said cams are caused to rotate and said pair of forward tension cables causes rotation of said pair of pulleys;

g. a pair of rear tension cables in cooperation with said pair of limbs and said pair of cams, whereby when said bowstring is drawn, said pair of cams rotate, and said forward tension cable unwinds from said pair of cams, and said rear tension cables wind on said pair of cams, respectively;

h. synchronizing cable means in cooperation with said pair of cams to synchronize the rotation of said pair of cams when said bowstring is drawn;

i. synchronizing pulleys carried by said pair of cams and positioned on the frame with said synchronizing cable means reeved there about;

j. adjusting means in cooperation with said rear tension cable and said bowstring to permit adjusting the length of draw of said bow;

k. a frame aperture in said frame and a pivoting hand grip in said frame aperture to permit steady aiming of said bow;

l. a fletching slide means affixed to said frame between said cams and spaced from the frame toward a user to protect the feathers of an arrow being projected from engaging the synchronizing pulley means;

m. an arm guard positioned below said fletching slide on said frame; and

n. cam stop means mounted on cam seats in the rotational path of said cam to prevent further rotation of said cams at full draw of said bow.

3,923,036

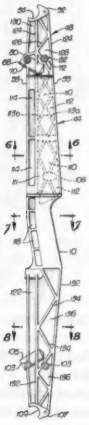
BOW STRUCTURE

Thomas Paul Jennings, Sun Valley; John Monroe Williamson, Hollywood, and Carl Sumida, Los Angeles, all of Calif., assignors to Jennings Compound Bow, Inc., North Hollywood, Calif.

Filed Nov. 12, 1973, Ser. No. 415,011

Int. Cl.² F41B 5/00

U.S. Cl. 124—30 R **20 Claims**



1. In a handle section for a compound bow,

said handle section having a front surface, a back surface, a longitudinal axis and a plane of bending passing through said longitudinal axis and being generally perpendicular to said front surface, said back surface and passing through a taut bow string when the handle section is connected to bow limbs;

said handle section having upper and lower ends for connection to an upper limb and a lower limb;

said handle section being formed of a lightweight metal and including an offset portion which is offset from said longitudinal axis and which portion lies in a plane that is offset from and generally parallel to the plane of bending of the handle section with the offset portion defining a window for the discharge of an arrow;

said offset portion having a ribbed surface which is generally parallel to said plane of bending with the ribbed surface including cross ribs positioned in planes that are transverse to the plane of bending of the handle section;

said ribbed surface including side ribs positioned in planes transverse to the plane of bending of the handle section with the side ribs being positioned adjacent to the front and rear surfaces of the handle section;

said side ribs being joined to said cross ribs with the cross ribs extending from the side ribs in a diagonal direction with respect to the longitudinal axis of said handle section;

said cross ribs and said side ribs forming recessed regions in said ribbed surface with the recessed regions being bounded by the rigid connection of the cross ribs and the side ribs,

whereby the weight of the handle section is reduced by the empty volume of the recessed regions, the handle section being resistant to shear and bending forces applied in the plane of bending of the handle section and in the plane of the offset portion with the diagonal cross ribs tending to translate shear forces in the handle section into compressive forces in the cross ribs and the rigid structure of the joined cross ribs and side ribs providing the handle section with resistance to bending in the bending plane of the handle section and in the plane of the offset portion.

3,923,037

COOKER

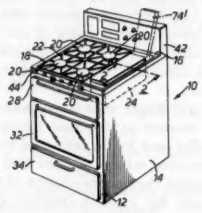
Joseph Donato, North Balwyn, Australia, assignor to Modern Maid (Vic.) Pty. Ltd., Footscray, Australia

Filed Oct. 1, 1974, Ser. No. 511,005

Claims priority, application Australia, Oct. 2, 1973, 5066/73

Int. Cl.² F24C 3/00

U.S. Cl. 126—39 C **7 Claims**



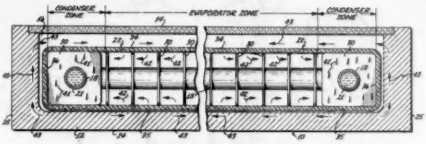
1. A cooker comprising, an oven compartment extending substantially across the width thereof, side-by-side grilling and warming compartments above the oven compartment, the grilling and oven compartments opening to the front of the cooker and the warming compartment opening to the top thereof, a cooking range on the top of the cooker adjacent the said warming compartment and above said grilling compartment, the cooking range including at least one heating device arranged for heating of the under-side of a cooking receptacle placed thereon, said warming compartment including a flat topped cover movable to a closed position at which the warming compartment is substantially closed with the top of the cover providing a surface for standing of cooking receptacles thereon and to an open position providing access to the warming compartment, thermal insulation between the grilling compartment, warming compartment and oven compartment, an internal electric heating element in the warming compartment for warming of articles placed therein, said warming compartment extending to a depth below the top of the cooker which is greater than the depth of the grilling compartment.

3,923,038

SOLAR ENERGY COLLECTOR PANEL

John M. Cutchaw, 7333 E. Virginia, Scottsdale, Ariz. 85257

Filed July 18, 1974, Ser. No. 489,529
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 15 Claims



1. A solar energy collector panel for collecting solar heat energy and transmitting that heat to a heat absorbing fluid, said solar energy collector panel comprising:

a. a wicking membrane of planar configuration;

b. passage means having an inlet and an outlet, said passage means configured for positioning adjacent the periphery of said wicking membrane and shaped to substantially conform therewith, said passage means adapted to allow movement of a heat absorbing fluid therethrough;

c. a vaporizable working liquid in said wicking membrane, said working fluid adapted to be vaporized upon impingement of solar heat energy on said wicking membrane with the resulting vapor movable toward said passage means for condensation proximate said passage means; and

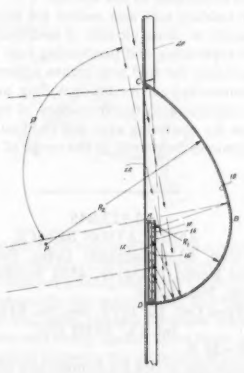
d. means for enclosing said passage means and said wicking membrane for hermetic sealing thereof, said means adapted to expose at least the central portion of said wicking membrane for impingement of solar heat energy thereon.

3,923,039

SOLAR ENERGY HEATING SYSTEM

Gerald Falbel, 472 Westover Road, Stamford, Conn. 06902

Filed Feb. 7, 1975, Ser. No. 547,917
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 10 Claims



1. A focused solar heating system for collecting both off- and on-axis direct and diffuse solar radiation and applying such radiation to a solar collector, comprising in combination

a. focusing reflector having an entrance aperture and a concave reflecting surface positioned behind said entrance aperture,

b. a solar collector plate mounted on said focusing reflector generally in the plane of said entrance aperture and substantially covering a lower portion of said entrance aperture when the curvature axes of said focusing reflector are in a horizontal orientation,

c. said solar collector plate being blackened or selectively absorbing on both front and rear surfaces thereof and forming a direct entrance aperture with the remainder of said entrance aperture forming a reflective entrance aperture,

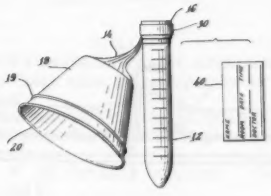
d. said concave reflective surface being a continuous, substantially curved surface of first and second merging curves formed by first and second radii of curvature, the first radius being substantially equal to the height of said solar collector plate and projecting from the uppermost point on said collector plate to form said first curve having a cylindrical shape behind said solar collector plate, said second radius being greater than said first radius and projecting from a point in front of and below said uppermost point of said first radius to form said second curve behind said reflecting entrance aperture such that solar radiation entering said reflecting entrance aperture is reflectively applied to the rear side of said solar collector plate.

3,923,040

BIOLOGICAL SPECIMEN COLLECTORS AND METHOD

Janet Beach, P.O. Box 904, Camden, Maine 04843

Filed June 24, 1974, Ser. No. 482,161
Int. Cl.² A61B 10/00
U.S. Cl. 128—2 F 6 Claims



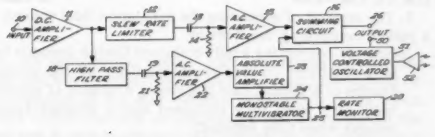
1. A container for collecting and storing specimens of material having an access opening with a peripheral rim on which is positioned one end of a tube for guiding specimens of material into said container, which tube is made from supple elastic material which is impervious to the specimens to be gathered, and a closure member comprising a closed elastic loop whose inside circumference in the unstretched state is smaller than the outside circumference of said tube positioned on said rim with a portion of the wall of said tube stretched over said opening in drumhead fashion and with parts of said wall of said tube adjacent said portion retainably enclosed about said rim by the positioning of said closure member thereon.

3,923,041

CARDIAC SIGNAL AUGMENTATION APPARATUS

Peter Stasz, Minneapolis, and Louis C. Cosentino, Wayzata, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 19, 1973, Ser. No. 342,701
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.06 R 9 Claims



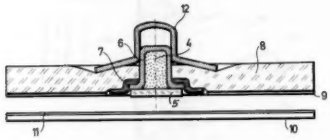
1. In cardiac instrumentation apparatus including electrode means adapted to be connected to a body to receive cardiac

pacer pulses and EKG pulses, the improvement comprising: input means for connection to the electrode means to receive the pulses; output means; EKG channel circuit means; cardiac pacer pulse channel circuit means; the EKG channel means including first means for substantially blocking pacer pulses; the pacer pulse channel means including second means for substantially blocking EKG pulses; means connecting the first and second means to the input means; third means for providing uniform pacer pulses in response to pacer pulses; means connecting the third means to the second means; summing means connecting the first and third means to the output means for summing the EKG pulses with the uniform pacer pulses prior to output; and the output means connected to means for receiving and displaying pulse information representative of the input signal.

3,923,042
ELECTRICAL DETECTOR/TRANSDUCER/APPLICABLE ON THE SKIN SURFACE FOR BIOMETRICAL OBSERVATIONS

László Hajdu; György Hegyessy; József Balla, and Gábor Vitán, all of Budapest, Hungary, assignors to Medicor Muvek, Budapest, Hungary

Filed Sept. 30, 1974, Ser. No. 510,708
Claims priority, application Hungary, Oct. 15, 1973, ME 1674
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.06 E 8 Claims



1. An electrical detector to fix to the skin for biometrical observations, comprising an electrically conductive housing defining a cavity having an open side and having a silver inner surface, a coherent porous body of silver grains compressed in said housing substantially filling the cavity and having cohesive bonds between contacting silver surfaces of said grains and between said grains and said housing surface, and a coating of silver chloride on the surfaces of substantially all of said grains other than said contacting surfaces.

3,923,043
METHOD FOR ACQUISITION OF EXHALATION TIDAL VOLUME AND MINUTE VENTILATION DATA

Roman L. Yanda, 15423 Vanowen St., Van Nuys, Calif. 91405

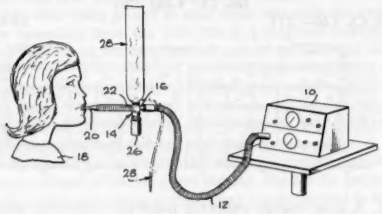
Continuation of Ser. No. 401,577, Sept. 28, 1973, abandoned, which is a continuation of Ser. No. 120,980, March 4, 1971, abandoned. This application Aug. 12, 1974, Ser. No. 496,410
Int. Cl.² A61B 5/08
U.S. Cl. 128—2.08 2 Claims

1. The method of measuring the exhalation tidal volume of a patient comprising the steps of:

selectively connecting a fully collapsed flexible inelastic bag to a respirator to receive substantially all the exhaled breaths of a patient, said bag having a volume of substantially zero when fully collapsed and a selected known volume when fully inflated;

accumulating all the exhaled breaths of said patient in said bag until said bag is fully inflated; and

providing on said bag a table of tidal volumes with respect to numbers of exhaled breaths necessary to fully inflate the bag whereby tidal volume can be read from the table

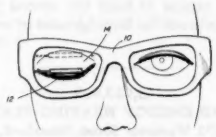


based on the number of exhaled breaths necessary to inflate the bag.

3,923,044
EYE LID BLINKER

David Miller, 5 Bridge St., Watertown, Mass. 02172

Continuation-in-part of Ser. No. 490,301, July 22, 1974, abandoned. This application Jan. 24, 1975, Ser. No. 544,001
Int. Cl.² A61H 1/02, 5/00
U.S. Cl. 128—25 A 13 Claims



1. An apparatus for blinking or closing the eye lid comprising:

arm means attachable to the eye lid,

means for holding said arm means for movement at least downwardly to cause closure of said eye lid,

means for supporting and positioning said arm means and holding means for said arm means adjacent the eye,

and electromechanical means including an oscillator and means responsive to the frequency of operation of said oscillator for operating said arm to close the eye lid at a predetermined frequency in the range of normal blinking rates.

3,923,045
AMBULATION DEVICE

Percy B. Talati, 6334 Salisbury Drive, Fort Wayne, Ind. 46816, and Daniel T. Dwyer, 4334 McMillen Park Drive, Fort Wayne, Ind. 46806

Filed Oct. 10, 1974, Ser. No. 513,640
Int. Cl.² A61H 1/02
U.S. Cl. 128—25 R 7 Claims

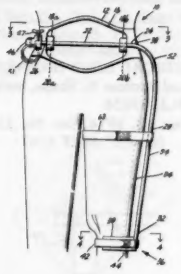
1. An ambulation device for hemiplegics and the like which comprises:

a torso-encircling band;

torsion shaft means being mounted on said band for horizontally positioning a torsion shaft across the small of a hemiplegic's back and for torsional rotation of said shaft about the longitudinal axis thereof;

a vertically extending leg-engaging arm extending alongside the paralyzed leg and having the upper end thereof attached to one end of said torsion shaft and the lower end disposed therebelow;

means for attaching said lower end of said arm to the paralyzed leg of said hemiplegic near the ankle; and



a swing lever having a first end thereof secured to the other end of said torsion shaft and a second end extending forwardly therefrom.

3,923,046

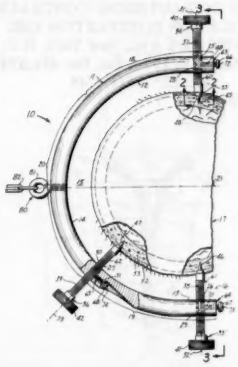
SKULL TONG

Milton D. Helfetz, 704 N. Bedford Drive, Beverly Hills, Calif. 90210

Continuation of Ser. No. 334,701, Feb. 22, 1973, abandoned. This application Sept. 4, 1974, Ser. No. 502,917

Int. Cl.² A61H *1/02*

U.S. Cl. 128—75 **11 Claims**



1. A skull tong for rigid engagement with a skull, comprising: a rigid frame comprising a first and a second arm member, and a transverse member joining the arms together, the members lying in substantially the same plane, and the arm members extending in the same general direction away from the transverse member and being spaced apart from one another so as to form a region between the members which is open at one end to receive a skull; a first and a second passage in the respective first and second arm members, and a third passage in one of said members, which third passage is spaced from the other passages, all of said passages opening into said region and each having a respective central axis; a thread in each of said passages; a first, second and third engagement rod, each rod having a respective central axis of rotation coaxial with the central axis of the respective passage; a thread on each of said engagement rods coaxial with the central axis of the rod, said engagement rods being threadedly engaged to the thread in the respective first, second and third passages, whereby rotating said rods moves the rods along their respective central axes into and out of said region, the threads of the respective passages and of the engagement rods which are threadedly engaged thereto having a dimension of pitch; a first, second and third lock means carried by the first and second arm members and by the transverse member, respectively, for engaging the respective engagement rods to hold them in a respective selected angular position; a drill on the end of each engagement rod concentrically with the respective central axis said drill comprising cutter means and a non-cutting portion which is axially aligned with the cutter means, said non-cutting portion providing a surface for engagement with the wall of a hole in the skull which is cut by the respective cutter means, the cutter means comprising an intersection with the said portion, and said portion comprising a fragment of a surface of revolution, whereby the frame may be placed over a skull with the engagement rods retracted sufficiently to clear the skull, and then the engagement rods may be rotated so as to advance them into the region and against the skull, further turning of the engagement rods causing the cutter means to drill respective holes in the skull to receive them, the pitch of the threads and the cutting capacity of the cutter means being so inter-related that the cutter means will cut a hole in the skull at a rate sufficient to enable the drill to enter the skull without substantial compression of the skull adjacent thereto, and engagement of the engagement rods by the respective lock means holding them in a selected position in the respective hole, thereby to keep the skull tong engaged to the skull.

3,923,047

JOINTS FOR ORTHOPAEDIC APPLIANCES

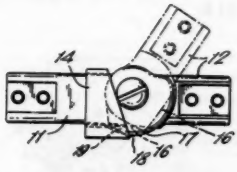
John Bernard Chant, Alton, England, assignor to Vessa Limited, England

Filed Nov. 18, 1974, Ser. No. 524,935

Claims priority, application United Kingdom, Mar. 8, 1974, 10514/74

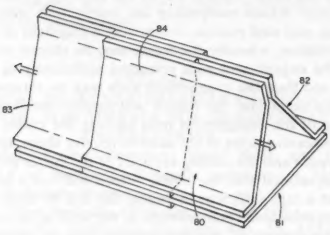
Int. Cl.² A61F *3/00, 5/00*

U.S. Cl. 128—80 F **3 Claims**



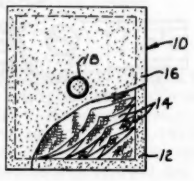
1. An orthopaedic caliper joint comprising interpivoted male and female members wherein a flat surface formed on the periphery of the male member is located between leaves of the female member throughout pivotal movement of the joint and is engageable by a key formed on the interior of a ring catch slidable over an extension of the female member when the joint is fully extended.

3,923,048
EXPANDABLE SPLINT
Charles H. Schaar, Lake Zurich, Ill., assignor to The Kendall Company, Boston, Mass.
Division of Ser. No. 378,405, July 12, 1973, which is a division of Ser. No. 128,267, March 26, 1971, which is a continuation-in-part of Ser. No. 41,377, May 28, 1970, abandoned. This application June 6, 1974, Ser. No. 476,951The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—87 R 1 Claim



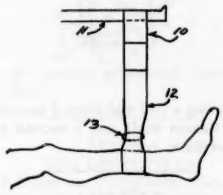
1. A splint comprising a plurality of bulkable products, each of said bulkable products comprising bendable sheet material superposed together in flat planar relation and presenting more layers of said sheet material in a central region of said product than in other regions thereof, means retaining portions of said layers in said central region in said superposed planar relation and remaining portions of said sheet material being movable independently of each other in a predetermined direction into irregularly bent non-planar layers patulously bulking said product and retaining said product in bulked configuration, said bulkable products being secured together so as to form a tubular article.

3,923,049
ORTHOPEDIC CAST AND METHOD OF CONSTRUCTING SAME
Leo E. Lauber, 101 W. 10th St., Eudora, Kans. 66025, and Ernest A. Cowden, 871 New Brotherhood Bldg., Kansas City, Kans. 66101
Filed June 28, 1974, Ser. No. 483,970
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—91 R 7 Claims



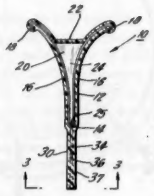
1. A method of constructing a casting blank from which a plaster cast for a portion of the body may be formed, said method comprising:
providing first and second sheets of deformable water absorptive material,
at least one of said sheets being fibrous material characterized by an affinity for moistened plaster,
the other of said sheets comprising a cellular material characterized by a non-affinity for moistened plaster;
placing a quantity of plaster between said first and second sheets; and
joining said first and second sheets together to enclose said plaster material therebetween.

3,923,050
MEDICAL LIMB HARNESS
Michael S. Zeide, and Spencer N. Shaps, both of 2000 Linwood Ave., Fort Lee, N.J. 07024
Filed Dec. 13, 1974, Ser. No. 532,504
Int. Cl.[2] A61F 5/40
U.S. Cl. 128—94 1 Claim



1. In a medical limb harness the combination comprising of two loops connected together, made out of fabric or materials with fabric like properties, and a sliding tightening device designed in any geometrical shape, with said sliding tightening device capable of traversing the lengths of said loops while encompassing the width of said loops.

3,923,051
INFLATABLE INTRAUTERINE CONTRACEPTIVE DEVICE FOR POSTPARTUM USE
Samuel Solchet, 1088 Park Ave., New York, N.Y. 10028
Filed Mar. 18, 1974, Ser. No. 451,831
Int. Cl.[2] A61F 5/46
U.S. Cl. 128—130 21 Claims

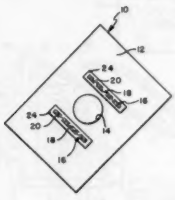


1. An intrauterine contraceptive device, comprising:
a hollow inflatable member defining a chamber therein, said member being of a size sufficiently small when it is deflated to permit insertion of said member through the cervix and of a size sufficiently large to prevent passage through the cervix when such member is substantially inflated;
outlet means communicating with said chamber for permitting exit of inflation fluid from such chamber; pressure responsive means in said outlet means, said pressure responsive means including means normally sealing said outlet means against fluid exit therethrough and being responsive to pressure in said chamber that is above a predetermined level to open said outlet means until pressure in said chamber decreases below said predetermined level and said pressure responsive means then reclosing said outlet means at pressure below said predetermined level.

3,923,052
CONFORMABLE SURGICAL DRAPE

Richard L. Zoephel, Lake Villa, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 260,173, June 6, 1972, abandoned.
This application Dec. 3, 1973, Ser. No. 420,930
Int. Cl.² A61F *13/00*
U.S. Cl. 128—132 D 3 Claims

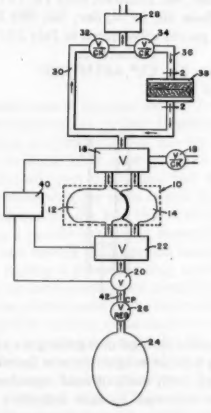


1. A fenestrated surgical drape comprising at least one sheet, said sheet having a fenestration, and a plurality of strips of non-elastic, non-resilient conformable deformable material, provided around the periphery of the fenestration and secured to said sheet, said strips being deformable to conform closely to irregular body contours in the region of a surgical site to provide close fitting of the drape therearound.

3,923,053
RESPIRATORY PROTECTIVE DEVICE

David Gulld Jansson, 85 Pond St., Natick, Mass. 01760

Filed July 29, 1974, Ser. No. 492,740
Int. Cl.² A61M *16/00*
U.S. Cl. 128—142 13 Claims

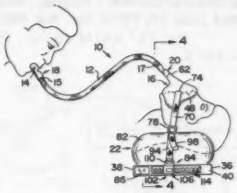


1. A respirator comprising:
a source of oxygen-rich gas;
a chamber having a substantially fixed volume, said chamber being vented;
first and second compliant breathing bags within said chamber, each of said bags having a filled volume within said chamber substantially equal to the volume of the chamber;
means to alternately activate one of said bags for breathing; means to open said source to fill said activated bag with a quantity of said gas; and
means to vent the other bag as said activated bag is filled, said other bag being contracted by expansion of said activated bag during filling.

3,923,054
RESUSCITATION DEVICE

George H. Bauer, Jr., 5616 Ruth St., Metairie, La. 70003

Filed May 13, 1974, Ser. No. 469,410
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.5 19 Claims

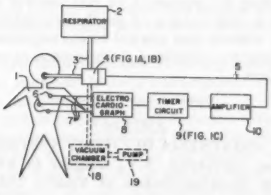


1. A resuscitation device of the type designed and constructed for use by a single individual in rendering artificial respiration to a victim, said device comprising: airway means; operator mouthpiece means attached in fluid communicating relationship with said airway means; patient mask means attached in fluid communicating relationship with said airway means; flow-direction regulating means disposed in operative position between said operator mouthpiece means and said patient mask means providing a one-way flow from said mouthpiece means to said patient mask means during insufflation of the lungs of the victim and a one-way flow from said patient mask means to the atmosphere during deflation of the lungs of the victim; and head support means attached to said patient mask means, said head support means comprising a base means for supporting the head of the victim including longitudinal adjustment means mounted thereon in parallel relation to a longitudinal axis of said base means; and securing means attaching said patient mask means to said adjustment means, whereby said patient mask means may be removable and longitudinally adjustable to said head support means.

3,923,055
PROCESS AND DEVICE FOR CONTROLLING THE PRESSURE COURSE OF A RESPIRATOR

Konrad Hammacher, Kaiseraugst, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 15, 1974, Ser. No. 524,172
Claims priority, application Switzerland, Nov. 21, 1973, 16429/73
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 14 Claims

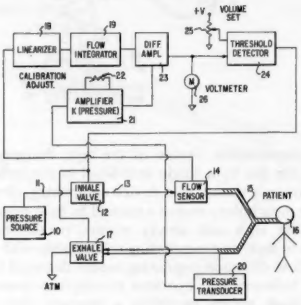


1. A process for controlling the pressure course of a respirator comprising momentarily decreasing the pressure of the respiration gas under the control of a pulse-synchronized signal derived from a measurement of impulses produced by the heart of the patient associated with the respirator in each case during the propagation time of the pulse wave in the pulmonary alveolar blood vessel flow paths of the patient and immediately thereafter causing substantially a re-establishment of the pressure of the respiration gas.

3,923,056
COMPLIANCE COMPENSATION FOR ELECTRONICALLY CONTROLLED VOLUME RESPIRATOR SYSTEMS

Richard Bingmann, Audobon; Frank J. Desiderio, West Chester, and Donald O'Neal Edwards, Philadelphia, all of Pa., assignors to General Electric Company, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,799
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **3 Claims**



1. In a respirator including

an interconnecting hose assembly adapted to be connected to a patient and connected to an inhalation passageway and to an exhalation passageway and further including a pressurized gas source connected to said inhalation passageway and a flow control valve and flow rate sensor connected in said inhalation passageway intermediate said source and said interconnecting hose, a flow control valve in said exhalation passageway and control means responsive to said flow rate sensor to control operation of said flow control valves, the improvement comprising:

pressure responsive means connected to said interconnecting hose assembly for developing a first signal representative of a (the) gas pressure in said interconnecting hose assembly, means for supplying said first signal to said control means for modifying the operation of said control means in porportion to gas pressure in said interconnecting hose assembly; and

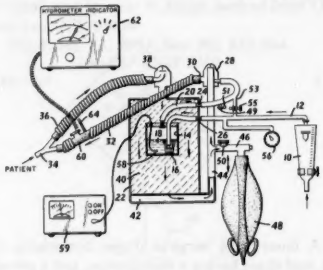
an integrating circuit means connected to said flow rate sensor for developing a second signal proportional to a volume of gas passing through said flow sensor, means for supplying said second signal to said control means for controlling the operation of said control means in response to said volume of gas flowing through said flow sensor, wherein said control means responds to said second signal by controlling the operation of said flow control valves.

3,923,057
ANESTHESIA DELIVERY SYSTEM

Jack Chalon, Tarrytown, N.Y., assignor to Albert Einstein College of Medicine-Division of Yeshiva University, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,167
Int. Cl.² A61M *16/00*
U.S. Cl. 128—188 **13 Claims**

1. In an anesthesia delivery system for a patient said system having a first canister with a gas diffusion stone and water contained therein for humidifying anesthetic laden gas to be fed to the patient, means for feeding anesthetic laden gas to said first canister via said diffusion stone, said water covering at least part of said gas diffusion stone whereby said dry anesthetic laden gas becomes humidified upon passage through said water, said anesthetic laden gas passing through said diffusion stone and said water, and means for removing humidified, anesthetic laden gas from said first canister and feeding it to said patient, the improvement comprising: a second canister surrounding said first canister, reactive material means in said second canister for reacting with carbon dioxide laden gases in an exothermic reaction, said reactive

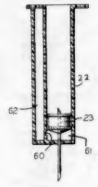


material means at least partly surrounding said first canister, means for feeding said carbon dioxide laden gases to said second canister whereby the reaction of carbon dioxide with said reactive material means liberates heat which heats the water in said first canister for humidifying the anesthetic laden gas passing through the water in said first canister.

3,923,058
MULTI-CHAMBER SYRINGE

Charles Z. Weingarten, Wilmette, Ill., assignor to The Kendall Company, Walpole, Mass.

Continuation of Ser. No. 255,099, May 19, 1972, abandoned. This application June 28, 1974, Ser. No. 484,104The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 R **6 Claims**

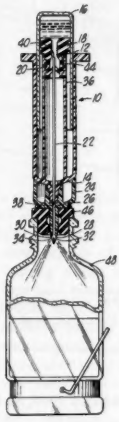


1. A multi-chamber syringe comprising a cylinder having at least one floating barrier means therein forming at least two separate chambers, with each of said chambers containing a liquid, a plunger received in said cylinder, hollow needle means attached to one end of said cylinger and having an unbroken cylindrical shell initially communicating with the chamber intermediate the barrier means and said one end of the cylinder, said shell projecting into said cylinder far enough to puncture and seal said barrier around the periphery of said unbroken cylindrical needle shell to prevent the liquids in the two chambers from mixing when said barrier nears the en of its travel as said syringe is emptied responsive to movement of said plunger, and means associated with said cylinder between said one end and said barrier means for relieving back pressure on said barrier after said needle punctures said barrier whereby said barrier may continue to settle after having been punctured and whereby said continued settling occurs without introduction of the contents of one of said chambers into the other of said chambers.

3,923,059
MEDICAMENT INJECTOR

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, South El Monte, Calif.

Continuation-in-part of Ser. No. 158,770, July 1, 1971, abandoned. This application Oct. 11, 1973, Ser. No. 405,583
Int. Cl.[2] A61M 1/00
U.S. Cl. 128—237 6 Claims

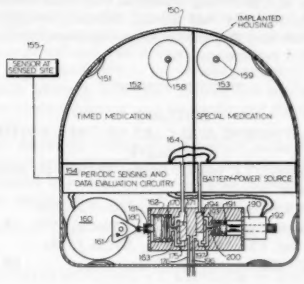


1. A novel medicament injector device for the addition of concentrated medication to rubber stoppered solution containers comprising: a cylindrical vial having an open end and a closed end, a resilient plug adapted to be inserted at least partially through said open end of said vial; said plug forming a sealing engagement with the walls of said vial with a press fit; a cylindrical member having one closed end, said cylindrical member holding a needle extending inwardly into said cylindrical member and having a sharpened inner end; said cylindrical member having a tip extending outwardly from said closed end, said tip surrounding and extending from the lower end of said needle portion said tip being an elongated member of generally uniform circular cross-section and having a central fluid passage extending substantially the length of the tip, said tip terminating in a pointed end in a zone of reduced cross-section, said zone having at least one fluid passage which communicates with said central fluid passage and forms an oblique angle with respect thereto; interlocking means on said cylindrical member and cooperating interlocking means on said plug, whereby upon interlocking of said plug with said cylindrical member said vial is first held in an assembled but non-operating position and upon further interlocking of said plug with said cylindrical member, said plug is adapted to be pierced by said needle and said needle communicated with said vial without the application of substantial axial pressure on said plug and said plug is locked securely to said cylindrical member to permit aspiration upon withdrawal of said vial or to permit expulsion of the contents of said vial into said solution container upon exertion of pressure on said vial, said pointed tip being adapted to pierce the stopper of said container without cutting loose pieces from the stopper and without the loss of any vacuum within said container.

3,923,060
APPARATUS AND METHOD FOR IMPLANTED SELF-POWERED MEDICATION DISPENSING HAVING TIMING AND EVALUATOR MEANS

Everett H. Ellinwood, Jr., 3519 Tonbridge Way, Durham, N.C. 27707

Filed Apr. 23, 1974, Ser. No. 463,262
Int. Cl.[2] A61M 5/00, 7/00
U.S. Cl. 128—260 20 Claims



1. A self-contained and powered apparatus adapted to be totally implanted within a selected animal body, including human, for periodically evaluating selected internal physiological states of such body and for periodically dispensing selected medication therein according to such states while leaving the body ambulatory at all times, comprising:

a. a unitary housing adapted to be completely implanted and secured within and to the body at a selected site and having therein various compartments enclosed by said housing and adapted for mounting a medication storage member, a micro size power source, miniaturized driving and dispensing means adapted to being powered by such source for dispensing medication from such storage member, miniaturized electrical data evaluation and timing circuit means adapted to being powered by such source and to processing physiological data including data obtained from sensor means external of the housing to control the operation of said driving and dispensing means and said housing being further adapted to receive connections from external sensor means through the wall of the housing;

b. a storage member mounted within the implanted housing and adapted to store selected medication to be dispensed in selected quantities;

c. a micro size power source mounted within the implanted housing and secured proximate said storage member and having a useful working life in terms of at least several days;

d. miniaturized electro-mechanical driving means mounted within the implanted housing and adapted for being connected to and powered by said source;

e. miniaturized dispensing means mounted within the implanted housing and connected to receive said medication from said storage member and adapted to be powered by said driving means at selected times and being adapted when so powered to withdraw from said storage member successive measured quantities of selected said medication and to discharge such medication from the implanted housing into said body;

f. sensing means selectively placed within said body externally of the implanted housing and adapted to produce sensed signals convertible to electrical data corresponding to a sensed condition within said body;

g. connector means connected to said sensing means and passing through the wall of said housing and adapted to transfer such signals to the housing to be processed therein;

h. miniaturized electrical data evaluation and timing means mounted within the implanted housing and connected to be energized by said power source and comprising:

1. miniaturized electrical circuit means connected through said connector means to said sensing means and adapted to receive selected data from said sensing means and convert such data into an electrically processable form and adapted for electrically evaluating such sensed data at selected times; and

2. timing means operatively connected to said circuit means and providing electrical time base information thereto whereby said driving means is energized and actuates said dispensing means in coordination with selected evaluations.

3,923,061

TOOL FOR HYGIENE AND CARE OF THE CAVITIES OF THE BODY

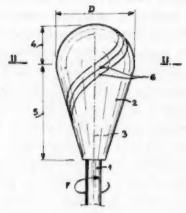
Jacques Rossignol, 12, rue H. Durre, 59230 - St. Amand les Eaux, France

Filed Nov. 4, 1974, Ser. No. 520,954

Claims priority, application France, Nov. 6, 1973, 73.40377

Int. Cl.[2] A61B *10/00*; A61M *35/00*

U.S. Cl. 128—269 **10 Claims**



1. An instrument for hygiene and care of cavities of the human body comprising a body portion, a stick for said body portion, padding on at least one end of said stick forming said body portion, said padding having a circumscribed shape of a body of revolution around the long axis of said stick, one end of said padding being a hemispherical cap and the other end of said padding being a base in the shape of an inverted truncated cone merging into said cap, and said padding being a plurality of normally contiguous flexible radial laminations around and extending from the axis of said stick forming said cap and said truncated cone into said body portion.

3,923,062

THREADED CLOSURE SYSTEM FOR MEDICAL LIQUID CONTAINER

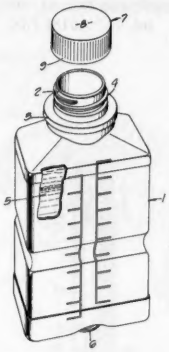
Elmer F. St. Amand, North Hollywood, and Thomas R. Thornbury, La Crescenta, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 7, 1973, Ser. No. 338,684

Int. Cl. A61j *1/00*

U.S. Cl. 128—272 **4 Claims**

1. A container with a threaded closure screwed onto a threaded neck forming a unit with inner and outer members, wherein the improvement is that the neck and closure are of different thermoplastic materials formed with substantially different internal stresses, said threaded closure and threaded neck being in a state of post-assembly stress relief with substantially greater amounts of shrink in the outer member causing the threaded neck and threaded closure to grippingly engage each other with increased tightness at a thermoplastic-to-thermoplastic bacteria-tight hermetic seal, and there is a deformable thermoplastic rib at the hermetic seal, which



closure is openable with a manually applied unscrewing torque despite the tight hermetic seal.

3,923,063

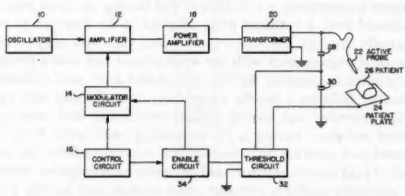
PULSE CONTROL CIRCUIT FOR ELECTROSURGICAL UNITS

Stephen William Andrews, and Stanley Woltosz, both of Rochester, N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed July 15, 1974, Ser. No. 488,281

Int. Cl.[2] A61N *3/00*

U.S. Cl. 128—303.14 **5 Claims**



1. In combination with an electrosurgical unit having a plurality of patient electrodes and RF generating means for providing an output voltage across said electrodes, a pulse control circuit connected to said electrosurgical unit for pulse modulating said output signal and controlling the duty cycle of said pulse modulated output signal applied to said plurality of patient electrodes, said pulse control circuit comprising:

voltage circuit means for sampling the magnitude voltage between said patient electrodes;

threshold circuit means for generating a threshold signal when the magnitude of said voltage between said patient electrodes exceeds a predetermined level, and

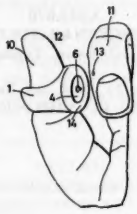
modulator circuit means for pulse modulating said output signal at a first duty cycle in the absence of said threshold signal and at a second duty cycle in response to said threshold signal.

3,923,064

DEVICE FOR ACUPUNCTURE

Karl Heinz Leupold, Gudrunstrasse 41, 85 Nurnberg, Germany

Filed July 24, 1974, Ser. No. 491,185
Claims priority, application Germany, May 17, 1974, 2424219
Int. Cl.² A61B 17/34
U.S. Cl. 128—329 A 5 Claims



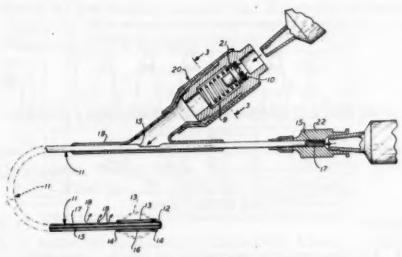
1. An acupuncture device comprising a ring-shaped holder adapted to be placed on a user's finger, said holder having means defining a rigid pressure plate disposed in a plane extending generally transversely of said ring-shaped holder, said holder further having a rim portion surrounding said pressure plate such that said pressure plate is located within a depression in said holder, said rim having an outer terminating edge, a pressure element located generally in the center of said pressure plate and projecting generally perpendicularly therefrom, said pressure element having a dull or rounded point which protrudes beyond said plane defined by the terminating edge of said rim, said device being adapted to effect self-applied acupuncture by placing said ring-shaped holder on one finger and applying said pressure element to the user's body such that said dull or rounded point engages the user's body to apply pressure thereto while said rim serves to prevent undesired penetration by limiting the extent to which said dull or rounded point engages the user's body.

3,923,065

EMBOLECTOMY CATHETER

Jerome Nozick, 47 Correy Lane, Watchung, N.J. 07060, and Alvin Barr, 42 Malvern Drive, Clark, N.J. 07066

Filed Sept. 9, 1974, Ser. No. 504,116
Int. Cl.² A61M 25/00
U.S. Cl. 128—348 3 Claims



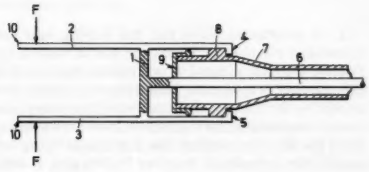
1. An embolectomy catheter comprising:
a. a thin, elongated flexible body insertable in a blood vessel, and dimensioned to fit therein,
b. separate, discrete first and second passages in the body,
c. a generally tubular expandable sleeve sealed at both ends around the distal portion of the body, the sleeve normally lying close to the body and concentric therewith along its enitre length,
d. a passage communicating from the inside of the sleeve through the wall of the body to the first passage in the body, whereby the tubular sleeve may be expanded by fluid applied to the first passage, and may be contracted by relieving fluid pressure applied to the first passage,
e. the second passage having a discharge orifice adjacent to the distal end of the body before the sleeve, whereby fluid injected into the second passage may be discharged therefrom,
f. a first fitting connected to the first passage, for introducing fluid into the first discrete passage,
g. valve means at the first fitting for retaining and releasing a fluid inserted into the first passage, whereby the sleeve may be inflated and deflated,
h. a fitting connected to the second passage for receiving a fluid, whereby such fluid so received may pass through the second passage and be discharged from a discharge orifice,
i. the discharge orifice in the second passage being positioned immediately adjacent to the inflatable sleeve and thereby to release fluid to drive an embolism away from the sleeve when it is inflated.

3,923,066

DEVICE FOR HOLDING A CATHETER IN AN EXTENDED CONDITION

Jacques Francisoud, Oullins, and André Sausse, Sceaux, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Dec. 27, 1974, Ser. No. 536,796
Claims priority, application France, Jan. 3, 1974, 74.00145
Int. Cl.² A61M 25/00
U.S. Cl. 128—348 15 Claims



1. A device for holding, in a longitudinally extended state, a catheter having an open proximal end, a closed distal end and an elastic bulge adjacent the distal end, the said device comprising a mandrel having a distal end and a proximal end insertable into the catheter, to move the distal end of the catheter away from its proximal end, a bearing component for the mandrel connected to the proximal end of the mandrel and at least one latching member mounted on the bearing component and releasably connectable to the proximal end of the catheter.

3,923,067

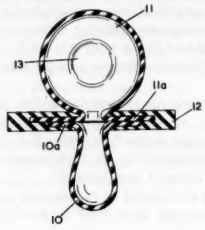
BABY SOOTHER

Eric Kenneth Hurst, London, England, assignor to Lewis Woolf Griptight Limited, Birmingham, England

Filed Jan. 11, 1974, Ser. No. 432,506
Claims priority, application United Kingdom, Jan. 13, 1973, 1893/73
Int. Cl.² A61J 17/00
U.S. Cl. 128—360 2 Claims

1. A baby soother comprising a flexible teat, a flexible handle portion separate from the teat, and a shield serving to secure the teat and handle permanently together at their junction, wherein the teat and handle portions have respective integral flanges which are arranged in juxtaposition, said shield being defined over and around said flanges to secure the

teat and handle portion permanently together, said flanges and said shield being chemically and mechanically bonded



together whereby said flanges and said shield form an integral mass.

3,923,068

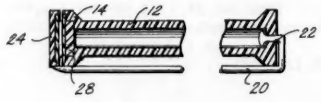
MAGNETIC PERMANENT WAVE FASTENER

Edwin Gilman, 29319 TreeHollow Glen, Agoura, Calif. 91301

Filed Aug. 30, 1974, Ser. No. 502,102

Int. Cl.² A45D *2/14*

U.S. Cl. 132—9 **4 Claims**



1. A permanent wave rod for waving hair comprising a cylindrical member on which the hair is wound, an elongated flexible member secured at one end to one end of the cylindrical member, cap means including a magnetic material connected to the other end of the flexible member, and magnetic means mounted in the cylindrical member at the opposite end from the flexible member, the cap means being locked to the end of the cylindrical member by bringing it into proximity with the magnetic means, whereby the flexible member is connected at opposite ends to opposite ends of the cylindrical member.

3,923,069

HEATING SLEEVE FOR A HAIR CURLER

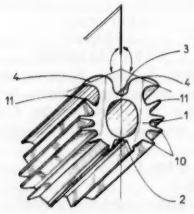
Jacques Leclabart, Paris, France, assignor to Perma, Paris, France

Filed Apr. 8, 1974, Ser. No. 459,168

Claims priority, application France, Feb. 8, 1974, 74.04333

Int. Cl.² A45D *2/36*

U.S. Cl. 132—36 CC **3 Claims**



1. A heating sleeve for hair curlers, comprising an elongate cylindrical body forming a pincer, a split along a generatrix of said body, two extensions on said body spaced on either side of the portion of said body diametrically opposed to the split and forming a hinge, said extensions forming organs for opening the pincer, a plurality of longitudinal vanes on said body in planes extending radially about the axis of the cylindrical body, said extensions having, in cross section, the form of horns forming an acute angle at their bases with the axial plane of symmetry of said body and curving towards the split and forming an obtuse angle with said plane at their points.

3,923,070

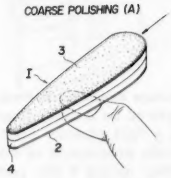
SYSTEMATIC FINGERNAIL POLISHING METHOD

Sakichi Tsukamoto, 2-3-chome, Toyotama, Nerima, Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,653

Int. Cl.² A45D *29/00*

U.S. Cl. 132—73 **2 Claims**



1. A systematic fingernail polishing method comprising the steps of coarse and fine polishing of a fingernail by a nail file having coarse and fine meshed surfaces on both sides thereof, and finish polishing said fingernail by coarse and fine buff members together with the use of a paste and a powder in repetition of unidirectional motions by hand, said paste comprising a mixture of diatomaceous earth, glycerin, propylene glycol, stearic acid, food dye and refined water.

3,923,071

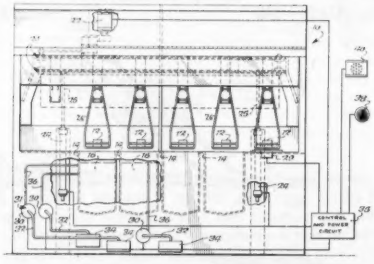
AUTOMATIC LIQUID FEED INTERLOCK WITH WORKLOAD

George J. Lada, Newport Beach, Calif., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,767

Int. Cl.² B08B *3/02, 11/02*

U.S. Cl. 134—47 **8 Claims**



1. An apparatus for processing an article comprising:
at least one process tank containing processing liquid;
a conveyor for transporting the article to the tank, for immersing the article in the processing liquid, for removing the article from the processing liquid and for transporting the article away from the process tank;
a sensing device for determining when processing of the article through the process tank has been completed;
means for adding liquid to the process tank to replace liquid removed from the tank by the processed article;

a conveyor travel power circuit for providing power for operating the conveyor;

a metered filling power circuit for providing power to the adding means and for controlling the amount of liquid added to the process tank by the adding means; and

a control circuit connected to the sensing device for activating the metered filling power circuit when the sensing device signals that processing of the article through the process tank has been completed thus causing the adding means to replace liquid removed from the process tank by the article;

wherein the control circuit comprises a fast acting relay activated by the sensing device, and a metering relay connected with and activated by the fast acting relay which metering relay activates the metered filling power circuit.

3,923,072

APPARATUS FOR THE TREATMENT OF PARTS BY SUCCESSIVE IMMERSIONS IN AT LEAST TWO BATHS

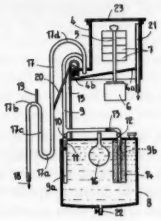
Jean-Louis Beaud, Rue de la Dime 9, Neuchatel, Switzerland

Filed Sept. 5, 1974, Ser. No. 503,349

Claims priority, application Switzerland, Sept. 11, 1973, 13390/73

Int. Cl.² B08B *3/04*

U.S. Cl. 134—99 **9 Claims**



1. Apparatus for successively immersing parts in at least two baths comprising

a treatment vessel in which the parts are immersed,

a plurality of separate bath reservoirs disposed below said vessel such that a bath in said vessel can flow by gravity into said reservoirs,

a plurality of siphon conduits each connecting one of said reservoirs with said vessel for siphoning a bath in said vessel to said one reservoir, and

means for pressurizing each of said reservoirs in order to force the bath therein into said vessel through the corresponding one of said siphon conduits.

3,923,073

MEANS FOR HEATING INCOMING WATER IN A DISHWASHER

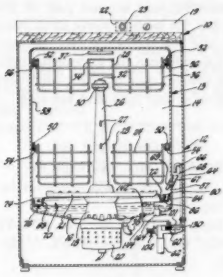
James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,540

Int. Cl.² B08B *3/02*

U.S. Cl. 134—57 D **4 Claims**

1. A water fill system for a dishwasher having a washing compartment and a water collecting sump, a fill valve and drainage means for said compartment, electrical operating means for effecting the operation of the inlet of said fill valve, a motor-pump unit for selectively pumping water to spray means or to said drainage means, an elongated sloped trough positioned between said washing compartment and said sump, said trough having outlet means adjacent its low end communicating with said sump, electrically energizable heating means disposed coextensive with said trough, conduit means for conducting water from said valve to the high end of said trough, cycle control means for energizing said fill valve inlet to permit water from a domestic supply to flow into said valve, said valve having first orifice means adapted to be opened and closed by valve flow restrictor means, said valve having second orifice means permitting a predetermined amount of bypass water to flow therethrough into said trough high end upon energization of said fill valve electrical operating means, thermostatic means biasing said restrictor means to an open



position upon said thermostatic means sensing a predetermined trough water temperature, said thermostatic means operative for moving said restrictor means toward a closed position in response to sensing the trough water temperature below said predetermined temperature, whereby incoming fill water flows in said trough in a heat exchange manner therewith at a temperature-responsive rate such that fill water enters said sump through said trough outlet at or above said predetermined temperature.

3,923,074

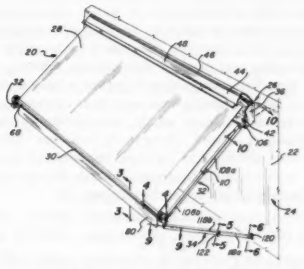
ENCLOSABLE RETRACTABLE AWNING

Donald S. McKee, Louisville, Colo., assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Nov. 11, 1974, Ser. No. 522,640

Int. Cl.² E04F *10/06*

U.S. Cl. 135—5 AT **14 Claims**



14. A retractable awning assembly adapted to extend outwardly from a generally vertical surface comprising in combination:

a housing adapted to be mounted adjacent to said generally vertical surface,

a flexible awning sheet having an inner edge mounted in said housing,

a roll bar movable from a position within the housing to a position spaced from the generally vertical surface, means securing an outer edge of the awning sheet to the roll bar so that the sheet can be wrapped around the roll bar when the bar is positioned within the housing and extended between the housing and the roll bar when the

roll bar is positioned at a spaced location from the generally vertical surface, and

a first pair of brace members, means interconnecting said housing and said roll bar and swingably mounting said first pair of brace members for pivotal movement into said housing regardless of the position of said roll bar, and,

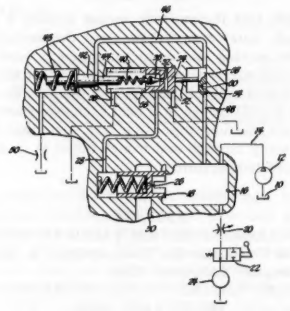
a second pair of brace members adapted to interconnect said roll bar and said generally vertical surface at a location which is spaced beneath said housing and means swingably mounting said second pair of brace members with said roll bar for pivotal movement into parallel relationship with said roll bar while said roll bar is positioned at a location spaced from the generally vertical surface so that both said second pair of brace members and roll bar can be moved as a unit into said housing.

3,923,075

POWER TRANSMISSION

Robert G. Farrell, Royal Oak, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed May 16, 1974, Ser. No. 470,472
Int. Cl.[2] G05D *16/10;* **F16K** *17/00*
U.S. Cl. 137—491 **7 Claims**



1. A fluid pressure relief system responsive to the rate of pressure rise in a fluid power transmission comprisng a body having a bore with an inlet and an outlet connected by a valving passage, a valve movable in the bore and urged by inlet pressure to open the passage to the outlet, mainspring means for urging the valve and passage into closing relation, a first spring force modifier comprising a piston exposed to inlet pressure and a biasing spring opposing that pressure and arranged to decrease the force of the mainspring as the inlet pressure increases, a second spring force modifier exposed to inlet pressure and arranged to increase the force of the mainspring as the inlet pressure increases, and dashpot means for delaying the action of the second modifier.

3,923,076

TRANSMISSION CONTROL SYSTEM WITH DUAL PURPOSE MODULATING VALVE

William Wayne Blake, Wyoming, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

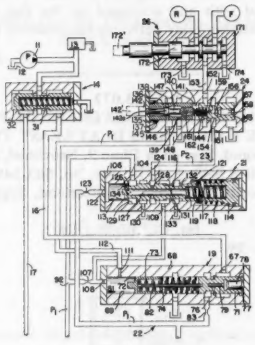
Division of Ser. No. 355,191, April 27, 1973, Pat. No. 3,882,980. This application Jan. 8, 1975, Ser. No. 539,273
Int. Cl.[2] F16K *31/12, 31/143*
U.S. Cl. 137—495 **4 Claims**

1. A manual modulating valve for a hydraulic control circuit of the type having a first conduit with first modulating means for establishing the first fluid pressure within the first conduit, a second fluid conduit and differential means for establishing a second fluid pressure within the second conduit differentially related to the first fluid pressure, the manual modulating valve comprising,

a valve body defining a bore, an inlet passage communicating the second conduit with the bore and an outlet passage also in communication with the bore,

a modulating spool movably arranged within the bore to regulate fluid communication between the inlet and outlet passages of the valve body, and

a manually adjustable metering spool movably arranged within the bore for interaction with the modulating spool through resilient means, the valve body forming an additional inlet passage for communicating the first conduit with the bore adjacent the manually adjustable metering spool, the manually adjustable metering spool being movable for causing the modulating spool to regulate fluid communication between the inlet and outlet passages, the manually adjustable metering spool simultaneously communicating the additional inlet to a fluid drain in order to selectively reduce the first fluid pressure within the first conduit during operation of the modulating spool.

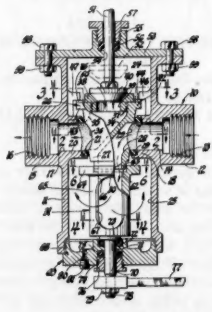


3,923,077

FLUID FLOW CONTROL VALVE

Paul J. Scaglione, 30180 Richmond Hill Drive, Farmington, Mich. 48024

Division of Ser. No. 283,574, Aug. 24, 1972, Pat. No. 3,826,466. This application Apr. 22, 1974, Ser. No. 462,883
Int. Cl.[2] B01D *35/02*
U.S. Cl. 137—546 **4 Claims**



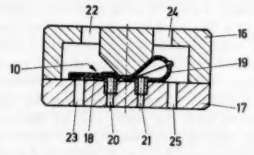
1. A fluid flow control valve comprising:

a. a valve body having a chamber therein;
b. an inlet passage communicating with said valve body chamber and an outlet passage communicating with said valve body chamber at a point diametrically opposite to the inlet passage;
c. an annular seal around each of said passages and being disposed at the point where each of said passages communicates with said valve body chamber;
d. a rotatable valve in said chamber and being operatively seated between and against said annular seals;
e. said rotatable valve having a pair of chambers formed therein with one of said chambers comprising an inlet chamber having an inlet port communicating with said inlet passage and an outlet port communicating with said valve body chamber, and the other of said pair of chambers comprising an outlet chamber having an inlet port communicating with said valve body chamber and an outlet port communicating with said outlet passage whereby fluid entering said inlet passage will pass through said rotatable valve inlet chamber and into said valve body chamber and thence into said rotatable valve outlet chamber and into said outlet passage;
f. means releasably connected to said rotatable valve for rotating said rotatable valve to a first position to permit said flow of fluid from said inlet passage and through said rotatable valve to said outlet passage, and to a second position whereby the flow of fluid between the inlet passage and outlet passage is blocked by said rotatable valve;
g. said rotatable valve including inner surfaces which are arranged to form said inlet and outlet chambers and direct fluid flow through the rotatable valve between said inlet passage and said outlet passage when the rotatable valve is rotated to said first position;
h. each of said annular seals comprising stationary seals;
i. said annular seals comprising wedge shaped seals; and,
j. a strainer means mounted in said valve body chamber and operatively connected to the outer port of said rotatable valve inlet chamber for straining the fluid passing through said last mentioned inlet chamber and into said valve body member.

3,923,078
VALVE ASSEMBLY

Georg Hirmann, Zurich, Switzerland, assignor to Rudolf Felix Homberger, Schaffhausen and Kurt Mayer, Olten, both of, Switzerland

Division of Ser. No. 389,137, Aug. 17, 1973, Pat. No. 3,881,686. This application Oct. 24, 1974, Ser. No. 517,615
Claims priority, application Switzerland, Aug. 24, 1972, 12046/72; Aug. 24, 1972, 12047/72
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—597 **2 Claims**

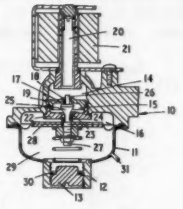


1. A valve assembly comprising a casing having a a plurality of valve seats therein, inlet and outlet connections communicating through said seats, a like plurality of valves within said casing each disposed for engagement with and displacement from one of said seats, between the inlet and outlet connection, each of said valves comprising a pair of leaf members peripherally joined together, at least one of said leaf members being flexibly deformable and defining with the other leaf member an inflatable chamber, each of said valves in its relaxed state with said chamber deflated engaging its valve seat and thus closing the valve seat, a control conduit communicating through one of said leaf members with said inflatable chamber of each valve, a source of inflating fluid, and means for introducing an inflating fluid under pressure from said source through said conduit into said chamber, whereby the chamber is inflated and the flexible leaf is thereby deformed to displace the valve from and thus open the valve seat.

3,923,079
FLUID CONTROL VALVE

John Malcolm Kyffin Hughes, Solihull; Graham Albert John Lake, and Stephen John Ford, both of Birmingham, all of England, assignors to Parkinson Cowan Appliances Limited, Birmingham, England

Filed Dec. 12, 1973, Ser. No. 426,623
Int. Cl.[2] F16K *17/168*
U.S. Cl. 137—614.14 **2 Claims**



1. A fluid control valve comprising a body, first, second and third chambers within said body, a first valve member operable between a first position in which in use it precludes fluid flow between said first and second chambers and a second position in which it permits fluid flow between said first and second chambers, and a second valve member operable in use to control the quantity of fluid flow between said second and third chambers, said second valve member being operatively connected to a diaphragm which extends between said third chamber and a compensating chamber which is connected to an external source of pressure, said second valve member including an abutment engageable by said first valve member when the latter is in its first position to urge said second valve member into a position in which it precludes fluid flow between said second and third chambers, said second valve member being movable with said diaphragm when the first valve member is in its second position.

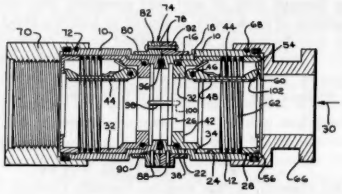
3,923,080
FRANGIBLE VALVED FITTING

Alan R. Allread, Jackson, and Kenneth A. Levering, Jerome, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 11, 1974, Ser. No. 441,242
Int. Cl.[2] F16K *17/36, 17/40*
U.S. Cl. 137—68 **16 Claims**

1. A frangible valved fitting comprising, in combination, a valve body having a passage defined therein defining a flow path and having an inlet and an outlet, frangible means connecting said valved body to conduit means, a flapper valve within said passage pivotally mounted within said body upon a pivot axis transversely disposed to said passage for movement between open and closed positions, valve seat means defined within said passage cooperating with said flapper valve when in said closed position to close said passage, valve retaining means within said passage releaseably retaining said flapper valve in said open position, and flapper valve operat-

ing means sensing connection of said body to said conduit means and controlling operation of said retaining means permitting said retaining means to release said flapper valve to close said passage upon fracturing of said frangible means.



3,923,081

AIR VALVE HAVING AN ANNULAR MOVABLE VALVE ELEMENT OF ELASTOMERIC MATERIAL

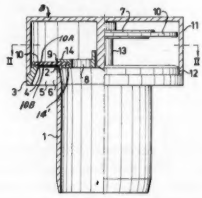
Bengt Arne Persson, Djursholm, Sweden, assignor to B. A. Installationsutveckling AB, Djursholm, Sweden

Filed Oct. 9, 1974, Ser. No. 513,312

Claims priority, application Sweden, Oct. 15, 1973, 73139842

Int. Cl.[2] F16K *24/02*

U.S. Cl. 137—217 4 Claims



1. An air valve connectable to a pipe to relieve a vacuum in said pipe while preventing the escape of fluid therefrom, said valve comprising:

a body having:

an inner chamber,

air inlet means for communicating said inner chamber with the ambient atmosphere;

said air inlet means including inner and outer concentrically spaced valve seats,

opening means for communicating said chamber with a pipe, and

a stationary guide element;

a valve element displaceably mounted in said chamber, said valve element being normally urged to a valve-closed position and being shiftable to a valve-open position in response to a vacuum in said pipe, said valve element comprising:

an annular disc formed of elastomeric material, said disc including an outer side facing said valve seats and an inner side facing said chamber,

a hub mounted for axial movement along said guide element and having hole means communicating said opening means with said chamber and with said inner side of said disc, when said valve element is in both said valve-open position and said valve-closed position, so that a vacuum at said opening means is transmitted through said hole means to the inner side of said disc to urge said disc away from said inner and outer valve seats to said valve-open position and the absence of a vacuum at said opening means casues said disc to be urged toward said inner and outer valve seats to said valve-closed position;

said hub including a flange upon which an inner edge of said outer side of said disc sits such that said disc is cantilevered outwadly from said hub, said outer flange terminating short of said inner valve seat such that in said valve-closed position said outer side of said disc sealingly engages said inner and outer valve seats to prevent fluid flow between said air inlet means and said opening means to prevent escape of fluid from said opening means.

3,923,082

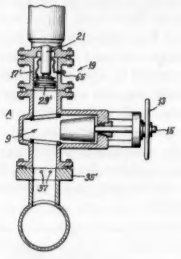
PIPELINE CLOSURE AND METHOD

George A. Blazek, Hinsdale, Ill., assignor to Advance Valve Installations Inc., Hinsdale, Ill.

Continuation-in-part of Ser. No. 242,728, April 10, 1972, abandoned. This application Sept. 12, 1973, Ser. No. 396,509

Int. Cl.[2] F16L *55/10*

U.S. Cl. 138—89 15 Claims



1. Apparatus for forming a fluid-tight closure within a pressure conduit while it is under pressure, said apparatus comprising a conduit section member having a fluid-flow passageway therethrough, a closure plug member slidable in the section member in a direction lengthwise of the passageway into a position for later closing the section, said closure member being of the same peripheral shape as, but smaller than, the peripheral shape of the passageway, characterized by the fact that there is an annular channel formed at the interface of one of said members with the open end of the channel facing radially of the passageway towards the other member, and sealing gasketing means in the channel, said gasketing means having (a) an intermediate position that it occupies during the positioning of the plug into the conduit section, and (b) a final pressure sealing position; said gasket means being movable from the intermediate position towards the open face of the channel to its final position and means for making connection to a source of pressure for pressurizing the channel to force the gasketing means into said final position, said last means including a check valve for retaining the pressure in the channel when said last means is disconnected from said source of pressure.

3,923,083

APPARATUS FOR STOPPING A TRAVELLING WAVE LOOM UPON ITS WEFT THREAD CARRIERS HAVING ENCOUNTERED AN OBSTACLE IN THE SHED

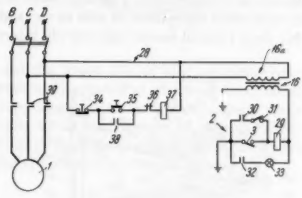
Anatoly Andreevich Bulantsev, Nagornaya ulitsa, 15-a, korpus 11, kv. 45; Alexandr Lvovich Galperin, ulitsa Moldagulovoi, 10, korpus 2, kv. 166; Alexandr Alexandrovich Zabotin, ulitsa Profsojuznaya, 96, kv. 85, all of Moscow; Evgeny Dmitrievich Loschilin, Kashirskoe shosse, 36, kv. 87, Domodedovo Moskovskoi oblasti, and Boris Alexandrovich Sakharov, ulitsa Krzhizhanovskogo, 24/35, korpus 6, kv. 404, Moscow, all of U.S.S.R.

Filed Oct. 22, 1974, Ser. No. 517,009

Claims priority, application U.S.S.R., Oct. 23, 1973, 1966187

Int. Cl.[2] D03D *47/24*, *51/18*

U.S. Cl. 139—12 6 Claims



1. An apparatus for stopping a travelling-wave loom when its weft thread carriers encounter an obstacle in the shed, comprising: a loom drive; an electric control circuit of said drive, provided with a power supply; a guideway for guiding and orienting the weft thread carriers in the shed, located in said shed and electrically connected to one of the poles of the power supply of said control circuit; movable contacts mounted in the weft thread carriers and protruding therefrom when these carriers encounter an obstacle in the shed to come in electrical contact with said guideway; a lining made of a conductive pile material arranged outside the shed along said guideway so that its piles pass between the warp threads inside the shed, said lining being connected to the opposite pole of the power supply of said control circuit and to the carriers moving in the shed, the piles of the lining being in permanent electric connection with the contacts of the carriers, as a result of which the very moment the carrier engages an obstacle in the shed, its contacts, while touching the guideway, cause the control circuit for the loom to be stopped.

3,923,084

APPARATUS FOR PACKAGING FLUID MATERIALS IN PACKETS

Ernest L. Matthews, and Ralph E. Matthews, both of Decatur, Ala., assignors to Matthews Machine Company, Inc., Decatur, Ala.

Filed May 29, 1974, Ser. No. 474,164

Int. Cl.[2] B65B *43/42*, *9/06*

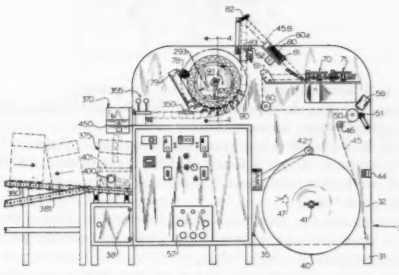
U.S. Cl. 141—144 5 Claims

1. An apparatus for dividing fluid material into uniform units and for packing the units, comprising:

a. a hollow cylindrical filling drum having a peripheral body portion and containing a volume of fluid material to be dispensed in discrete units;

b. a plurality of uniformly spaced and circularly arranged metering trap chambers formed in said peripheral body portion of said drum for rotation as an integral filling structure around a central horizontal axis, each chamber having a hollow housing formed with said peripheral body portion and a helical screw member having its axis oriented parallel to said central axis and fixed within said housing, each said chamber providing an open elongated fluid material flow path formed by said screw member and extending between an inlet communicating with the interior of said drum and an outlet laterally displaced along said flow path, said screw member being dimensioned to measure said unit;

c. means for rotating said filling structure at a uniform predetermined speed and in a constant direction around said central axis, each chamber being adapted on each rotation and at said speed to communicate its respective inlet with the interior of said drum at a first rotative station, to receive a portion of said fluid material into said flow path, to discharge through said inlet as said chamber rotates away from said first station all except a quantity equal to one unit of said material, and to guide said unit along said flow path towards said outlet under the influence of the rotative forces asserted thereon as said chamber rotates at said speed towards a second rotative station



whereby said unit is discharged from said outlet during passage of said chamber past said second station;

d. a storage receptacle containing a volume of said material stored below the level of said drum axis;

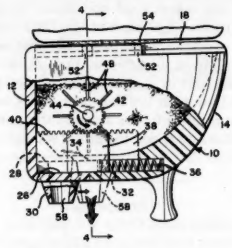
e. conveyor means arranged to convey said material from said receptacle to said drum along a conveying path which conveying path at the drum receiving end includes horizontal screw conveyor means comprising a helical conveyor screw surrounding a hollow hub and adapted for rotation independent of said drum around said central axis and communicating at its discharge end with said drum interior and at its intake end with said storage receptacle and includes in addition to said horizontal screw conveyor means an operatively associated additional screw conveyor means communicating at one lower end with the material in said storage receptacle and at the other end with the intake end of said horizontal screw conveyor means; and

f. leveling means independently controlling said conveyor means including said horizontal screw and additional screw conveyor means whereby said conveyor means may operate independently of said drum and being effective to operate said conveyor means intermittently as required to maintain a predetermined level of material in said container, said leveling means including a shaft mounted for rotation independent of, within and extending the length of said hub, said shaft having one forward end extending into said drum interior and having mounted thereon a rotatable sensing member for contacting and sensing the level of said material and controlling the rotative position of said shaft according to such level, said shaft having a rearward end mounting switch actuating means controlled by the rotative position of said shaft, and electric drive means controlled by said switch-actuating means for simultaneously driving said screw conveyor means during those times when said sensing member rotates within some predetermined angular range corresponding to a deplenished supply of material in said drum.

3,923,085
SEMI-AUTOMATIC PIPE LOADER

Fred Nimer, 956 Terry Drive, Troy, Ohio 45373

Filed Jan. 28, 1975, Ser. No. 544,690
Int. Cl.² A24F 9/02; G01F 11/00
U.S. Cl. 141—261 10 Claims



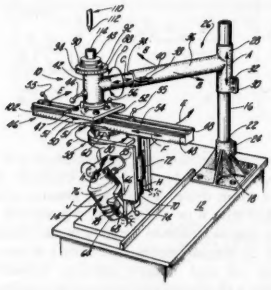
1. A semi-automatic pipe loader comprising:
a. a housing defining a storage chamber for holding a quantity of pipe tobacco,
b. a discharge spout projecting outwardly from a lower surface of said housing and having an outer dimension such that said spout is adapted to be received within a pipe bowl,
c. means for attaching an upper surface of said housing opposite said surface from which said discharge spout projects to a suppporting surface,
d. means defining a discharge opening from a lower portion of said chamber,
e. slide means for placing selectively said chamber discharge opening in communication with said discharge spout whereby tobacco in said chamber may be discharged therefrom through said spout and into a pipe bowl in which said spout is received,
f. means disposed within said storage chamber above said discharge opening therefrom for positive displacement of tobacco from said chamber through said discharge opening, and
g. means cooperating with said slide means for actuating said tobacco displacement means simultaneously with said placing of said discharge opening in communication with said discharge spout.

3,923,086
ADJUSTABLE RADIAL ARM APPARATUS FOR USE WITH A ROUTER OR THE LIKE

Daniel M. Spohn, Jr., 8451 Miller Road, Swartz Creek, Mich. 48473

Filed Feb. 25, 1974, Ser. No. 445,321
Int. Cl.² B27C 5/02; B23C 1/12
U.S. Cl. 144—134 B 12 Claims

1. An apparatus for selectively positioning a tool over a workpiece, comprising:
a vertically adjustable radial arm having its longitudinal axis disposed in a horizontal plane; said arm being movably secured at its proximal end for selective vertical movement and for angular rotational movement about said proximal end as an axis, and said arm comprising a sleeve member and a core member, said core member and said sleeve member being selectively linearly extendable and being selectively rotatable relative to each other about their longitudinal axis;
a cross slide pivot head secured to the distal end of said telescopic radial arm for linear vertical, linear horizontal, vertical plane rotational, and horizontal plane angular movement therewith, said pivot head having a pivot axis disposed generally perpendicular to the longitudinal axis of said core member and said sleeve member;
a rotatable head secured to said pivot head for all said linear, rotational, and angular movements therewith and for rotational movement relative to said head about an axis generally parallel to said pivot head axis;
a swivel slide block secured to said rotatable head for all the foregoing movements therewith, and wherein a first portion of said block is mounted for linear movement relative to said rotatable head in a direction generally parallel to said rotatable head axis and a second portion is mounted for pivotable movement about an axis generally perpendicular to said rotatable head axis; and wherein said second portion is adapted to hold said tool;
an elongated cross slide secured to said pivot head for linear vertical, linear horizontal, vertical plane rotational and horizontal plane angular movement therewith for rotational movement about the pivot head axis; and for slidable linear movement relative to and perpendicular to said pivot head axis;
feed means operatively associate with said swivel slide block to effect said linear movement of said swivel slide block; adjustable feed control means operatively interconnecting said swivel slide block and said rotatable head to effect said linear movement of said swivel slide block relative to said rotatable head;



feed control means comprising an elongated depth gage connected to said swivel slide block such that the longitudinal axis of said gage is disposed substantially parallel to the direction of linear movement of said swivel block slide, said gage projecting from said swivel slide block next to said rotatable head;
adjustable stops operatively associated with said gage;
an abutment attached to said rotatable head; said abutment and said stops coacting to limit linear movement of said swivel slide block;
a hollow locating aperture located through said cross slide pivot head concentric with the pivotal axis of said pivot head; and
a cross slide pivot head locating rod adapted to be removably inserted through said locating aperture, and wherein said locating rod is used to properly orient the pivotal axis of said cross slide pivot head with respect to the workpiece.

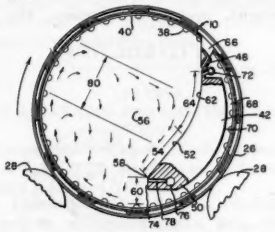
3,923,087
DRUM-TYPE DEBARKING APPARATUS INCLUDING LOG DEFLECTOR MEANS

Douglas L. G. Young, Lennoxville, Canada, assignor to Canadian Ingersoll-Rand Company Limited, Montreal, Canada

Filed Oct. 24, 1974, Ser. No. 517,463
Int. Cl.² B27L 1/04
U.S. Cl. 144—208 B 29 Claims

15. Debarking apparatus comprising drum means adapted to be rotatably driven in a predetermined circumferential direction, log deflector means within said drum means for controlling log movement therein during such rotation of said drum means, and means supporting said log deflector means

such that said drum means is rotatable relative to said log deflector means, said log deflector means including log deflecting face means angled between about 35° to about 45° from the vertical for downwardly directing logs towards its lower end, said log deflecting face means being generally upwardly facing and within the downturning side of said drum



means, and the lower end of said log deflecting face means being operatively associated with said drum means for downwardly supplying logs to said drum means whereby at least substantially all of the velocity of such supplied logs is in a direction other than said predetermined circumferential direction of the rotation of said drum means.

3,923,088

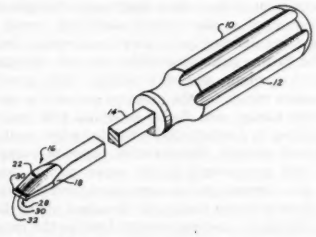
BITING SCREW DRIVER

Edward T. Arnn, 406 Club Lane, St. Matthews, Ky. 40207

Continuation-in-part of Ser. No. 473,840, May 28, 1974, Pat. No. 3,897,812. This application July 24, 1974, Ser. No. 491,361

Int. Cl.² B25B *15/02*

U.S. Cl. 145—50 A **2 Claims**



1. A screw driver comprising a shank and blade integral therewith, said blade having opposed major faces which are arcuately bowed outwardly to define a bulbous lower portion, said bulbous lower portion extending the entire width of said blade, said blade further including a smoothly radiused transition portion integral with a foot portion, said foot portion protruding outwardly away from the longitudinal axis of said shank to provide a gripping means, said foot portion further defining the lowermost portion of said blade and being generally isosceles-trapezoidal in side cross section with its base lying furthest from the shank in a substantially flat plane perpendicular to the axis of said shank at the lowest extremity of the blade, thereby being engagable with the bottom of the slot in a screw head, said foot portion further having its inwardly tapered sidewalls extending across the entire width of the blade and being engagable with the parallel sidewalls of a screw head slot, said base of said foot portion and said respective inwardly tapered sidewalls defining wedge-like bites comprising said gripping means engagable with opposed sides of a screw slot to removably hold a screw thereon and also cut a groove in the parallel sidewalls of a screw head slot upon application of a torque to said shank.

3,923,089

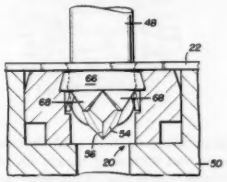
NUT AND PANEL ASSEMBLY

Harold A. Ladouceur, Livonia, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 353,049, April 20, 1973, which is a continuation-in-part of Ser. No. 149,517, June 3, 1971, abandoned. This application June 5, 1974, Ser. No. 476,747

Int. Cl.² F16B *39/282*

U.S. Cl. 151—41.73 **16 Claims**



4. A combination nut and panel assembly, said nut having a longitudinal axis, one axial extremity of said nut defining an end face engaging the panel and being generally perpendicular to said longitudinal axis, said nut having an axial circular bore projecting through said end face concentric with said axis for accomodating a self-tapping bolt, the improvement of a counterbore in said nut concentric with said axis and adjacent said end face, said counterbore terminating away from said end face in a plurality of equally circumferentially spaced indentations being generally triangular in the axial direction, said indentations defining a plurality of pointed extensions projecting toward said end face, said extensions having an inner cylindrical surface concentric with said axis and forming a longitudinal extension of the circular nut bore surface having a substantially the same internal diameter to accomodate the self-tapping bolt, the panel portion circumscribed by said bore being apertured and the panel material from said aperture being axially displaced of the nut into said counterbore to define a generally annular projection extending from said panel, said projecting terminating a plurality of triangular points conjugate with the triangular counterbore indentations, said triangular points having an inner diameter substantially the same as the diameter of the circular bore, wherein a bolt simultaneously threads into the triangular points of said displaced panel material within the triangular counterbore indentations and into the plurality of pointed extensions defined by said indentations prior to threading into said circular bore for stabilizing said nut on the panel against rotational and axial displacement.

3,923,090

DEVICE FOR SPOKING AND ALIGNING WIRE WHEELS

Gary W. Kinney, 2615 Scenic View Drive, Huntsville, Ala. 35810

Continuation-in-part of Ser. No. 278,629, Aug. 7, 1972. This application Oct. 10, 1974, Ser. No. 513,843

Int. Cl.² B21K *1/34*

U.S. Cl. 157—1.5 **2 Claims**

1. A device for spoking and aligning wire wheels comprising:

hub mounting means for gripping and providing an axial reference for the center of a hub of a wheel;

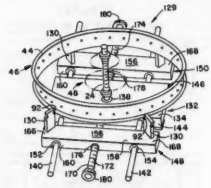
rim supporting means connected to said hub mounting means including means for adjustably and rigidly positioning a rim of a wheel concentrically with respect to said hub comprising:

four rim engaging members, and

travel guide means connected to said hub mounting means, being adjustable independent of a said wheel, for orienting and adjustably positioning said rim engaging members

along parallel spaced lines in a plane, said plane being perpendicular to and intersecting the axial reference of said hub comprising:

first and second carriage means, each rigidly connecting a pair of parallel arranged said rim engaging members, and



means for supporting each of said first and second carriage means and including means for positioning and orientation each of said pair of rim engaging members for travel along like lines and including means for moving each said pair of rim engaging members an equal distance from the axial reference of said hub mounting means.

3,923,091

METHOD OF SUPERVISING SKIN THICKNESS IN A SOLIDIFYING BODY SUCH AS A CONTINUOUSLY CAST INGOT

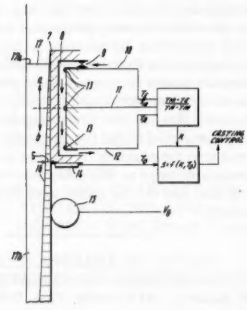
Wolfgang Dörr, Essen; Hartwig Matznor, and Tilman Noska, both of Duisburg, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Apr. 1, 1974, Ser. No. 456,899

Claims priority, application Germany, Apr. 17, 1973, 2320277

Int. Cl.[2] B22D *11/12*

U.S. Cl. 164—4 **12 Claims**



1. In a method for providing for an anticipating indication of weakening of the skin of a continuously cast ingot where emerging from the bottom of a liquid cooled mold, and wherein a location of the mold wall has been determined which is particularly prone to exhibit separation of the ingot skin as formed adjacently thereof during the casting, the improvement comprising the steps of:

measuring the heat transfer taking place in an upper portion of the mold at said location, well above the bottom thereof and of a width considerably smaller than the width of a mold side and providing an electrical signal representative thereof; and

detecting electrically the onset of deviation of the representation from a normal value indicative of absence of skin weakening or separation.

3,923,092

APPARATUS ARRANGED AFTER A CONTINUOUS CASTING INSTALLATION FOR RELEASING A THREAD-LIKE CASTING CONNECTION

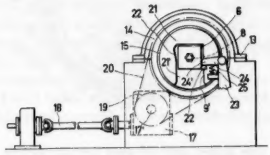
Georg Bollig, Meerbusch, and Willi Simons, Dusseldorf, both of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 28, 1974, Ser. No. 437,496

Claims priority, application Germany, Feb. 2, 1973, 2305038

Int. Cl.[2] B22D *11/08*

U.S. Cl. 164—274 **4 Claims**



1. An apparatus arranged after a continuous casting installation for releasing a thread-like casting connection from a dummy bar head of a dummy bar, comprising a dummy bar receiver means, a rotary mechanism associated with the dummy bar receiver means, said rotary mechanism being equipped with a receiving opening for a cropped end of the casting which possesses the thread-like casting connection, said rotary mechanism incorporating means for carrying out a relative rotational movement between the cropped end of the casting and the dummy bar head of the dummy bar in order to disconnect the thread-like casting connection of the cropped end of the casting from the dummy bar head of the dummy bar, said means for carrying out said relative rotational movement of the rotary mechanism comprises a rotary head constructed as claw means, said claw means having a lateral opening defining said receiving opening, the cropped end of the casting being insertable into and retractable from said lateral opening, said claw means being provided with fall-out safety means for the cropped end of the casting, said claw means having side flanks provided with recess means corresponding to a substantially pointed edge position of the cropped end wherein diametrically opposite corners of the cropped end are located in said recess means, and further wherein the cropped end has associated therewith stop means acting opposite to the screw-out direction of the thread-like casting connection, said stop means limiting the movement of the cropped end in a substantially vertical fall-out position.

3,923,093

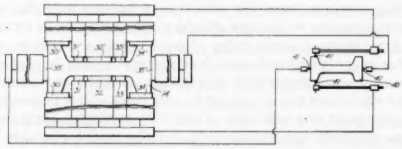
UNIVERSAL CONTINUOUS CASTING APPARATUS

Harry LaTour, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed May 16, 1974, Ser. No. 469,815

Int. Cl.[2] B22D *11/12*

U.S. Cl. 164—282 **11 Claims**



1. In a continuous metal casting machine having a mold through which molten metal may be poured, said mold communicating with a roller apron through which the solidifying

metal passes, a roller arrangement for the rolls of about the first one-third of said roller apron comprising:

a. a plurality of cylindrical rollers arranged in tiers, the rollers of each tier being adapted to contact each side and each edge of the metal as it issues from said mold in partially solidified form,

b. each of said rollers in each tier being individually adjustable inwardly and outwardly with respect to the path of said metal whereby to determine the cross sectional configuration of the solidifying metal.

3,923,094

CASTING APPARATUS FOR CASTING LARGE-SIZED INGOTS

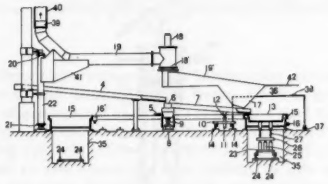
Takashi Furuse; Sachio Kamata; Kunio Sekine, and Koichi Sato, all of Akita, Japan, assignors to The Dowa Mining Co., Ltd, Tokyo, Japan

Filed Feb. 6, 1974, Ser. No. 439,858

Claims priority, application Japan, Feb. 19, 1973, 48-19178; Feb. 28, 1973, 48-23246

Int. Cl.² B22D *37/00, 39/00, 5/02*

U.S. Cl. 164—337 **6 Claims**



1. Casting apparatus comprising crucible means including heating means and pump means for supplying molten casting material, a plurality of molds arranged in an arcuate pattern about said crucible means, a longitudinal trough having a first end located to receive said molten casting material from said crucible means and a second end located to deposit said molten casting material into said molds, means mounting said trough at said first end thereof relative to said crucible means to enable both rotation of said trough about a vertical axis and tilting of said trough about a horizontal axis, means for effecting rotation of said trough about said vertical axis to direct said second end of said trough to a selected one of said plurality of molds to deposit said molten casting material therein, and means for effecting tilting of said trough about said horizontal axis to start and terminate flow of said molting casting material from said crucible means to a selected mold.

3,923,095

APPARATUS FOR SEPARATING MAGNETIZABLE CASTINGS FROM CASTING MOULDS OF SAND OR SIMILAR MATERIALS

Hemming Kristian Jorgensen, Klampenborg, and Marius Gunnergaard, Lyngby, both of Denmark, assignors to Dansk Industri Syndikat A/S, Herlev, Denmark

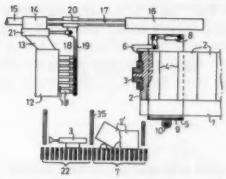
Filed June 18, 1974, Ser. No. 480,554

Claims priority, application Denmark, July 9, 1973, 3813/73

Int. Cl.² B22D *29/00;* **B25J** *3/00*

U.S. Cl. 164—404 **5 Claims**

1. An apparatus for separating magnetizable castings from a sand mold consisting of a succession of mold parts which are horizontally advanced stepwise to a mold breaking station at which each mold part is successively allowed to drop away so as to expose its respective casting comprising a carrier frame mounted in front of said mold breaking station so as to be displaceable towards and away therefrom, a plurality of magnets mounted in said carrier frame and protruding towards said mold breaking station, said magnets being individually displaceable relative to said carrier frame between an extended basic position and a retracted position, means biasing said magnets towards said basic position and permitting their individual retraction as they are brought in contact with the



exposed casting by displacement of said carrier frame towards said mold breaking station, and means for locking said magnets in their retracted positions relative to said carrier frame during the displacement thereof away from said mold breaking station whereby said casting is pulled and separated from a remaining mold part.

3,923,096

BUILDINGS

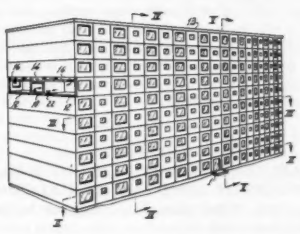
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Jan. 16, 1974, Ser. No. 433,765

Claims priority, application Netherlands, Dec. 20, 1972, 7217347

Int. Cl.² F24F *13/00*

U.S. Cl. 165—48 **11 Claims**



1. A multistory building which is comprised of a plurality of superimposed elongated box-shaped prefabricated sections, each of which encloses a portion of the living space in the building, each said section comprising a floor, at least one wall and a ceiling member, said wall extending higher than the top of said ceiling member whereby an air space constituting a channel for transporting air is defined in each said section by the top of said ceiling member, air conditioning means provided in the building in passage communication with said air space of each said section whereby air conditioned by said air conditioning means is received in said air space, said wall being adjacent said air space and the bottom of the floor of the section next above being adjacent to and defining the top of said air space, each said ceiling member and said floor comprising heat exchange means between said air space and the living space in the sections adjacent each whereby with a difference in temperature between the air in said air space and the air in said living space a heat transfer occurs through said member and said floor relative to said living space each said section having an opening in said ceiling member for the passage of air between said air space and the living space defined by such section, closure means in said opening and adjustment means for selectively opening said closure means,

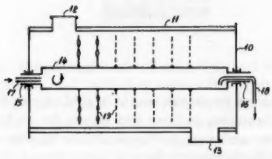
and thermostatic means in the living space provided by such section adapted to control said adjustment means.

3,923,097

HEAT EXCHANGER

Helge Hovad, Bagsvaerd, Denmark, assignor to A/S Atlas, Ballerup, Denmark

Filed Apr. 26, 1974, Ser. No. 464,642
Claims priority, application Denmark, May 1, 1973, 2352/73
Int. Cl.² F28G 17/00
U.S. Cl. 165—92 7 Claims



1. A heat exchanger for treating moist, tacky material, which comprises:

a. a stationary drum, having

b. an internal hollow shaft or rotor with inlet and outlet for the heat exchanging medium,

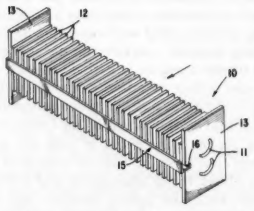
c. annular bodies in the shape of ribs encircling said rotor, each of said ribs being provided with a helical, hollow space, the inner end of which communicates with the hollow shaft, the outer end being closed, each said rib formed from a plane sheet, and the helical hollow space thereof being formed by attachment to the sheet of a helically cut strip of arcuate cross-section, and means for rotating said hollow shaft and the shaft attached annular rib shaped bodies in a direction such that the closed end of the helical space is in front whereby movement of the condensate back to the hollow space of the rotor is aided by the rotor movement.

3,923,098

FORCED AIR HEAT EXCHANGE UNIT WITH IMPROVED CONDENSATE REMOVAL CONSTRUCTION

Roland A. Ares, Wilmington, N.C., assignor to The Singer Company, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 439,505
Int. Cl.² F25D 21/14
U.S. Cl. 165—111 2 Claims



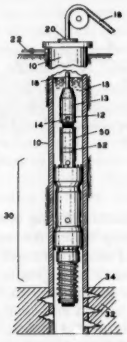
1. In a forced air heat exchange unit having at least one horizontally extending coil of thermally-conductive tubing supported between end plates and carrying thermally-conductive fins thereon, the improvement comprising at least one condensate channel connected across and supported within notches formed in all of said fins and end plates adjacent the downstream edges thereof, whereby condensate formed on said fins is conducted via such channel to the area of at least one of said end plates for collection and disposal, said channel and notches being dimensioned such that one leg and substantially all of the base of said channel nests within said notches with the base of the notches being substantially coextensive in height with said one leg of the channel, the other leg of said channel being of greater dimension than said one leg and extending upwardly outside of said notches in close proximity to the downstream edges of said fins.

3,923,099

METHODS OF WELL COMPLETION OR WORKOVER OF FLUID CONTAINING SUBSURFACE FORMATIONS

Clarence W. Brandon, Nashville, Tenn., assignor to Orpha B. Brandon, Nashville, Tenn., a part interest

Continuation-in-part of Ser. No. 355,239, April 30, 1973, abandoned, which is a continuation of Ser. No. 557,273, June 13, 1966, abandoned, which is a continuation-in-part of Ser. Nos. 853,405, Nov. 16, 1959, Pat. No. 3,255,820, and Ser. No. 665,995, June 17, 1957, Pat. No. 3,302,720, which is a continuation-in-part of Ser. No. 296,038, June 27, 1952, Pat. No. 2,866,509, and Ser. No. 241,647, Aug. 31, 1951, Pat. No. 2,796,129. This application Mar. 27, 1975, Ser. No. 562,995
Int. Cl.² E21B 33/13, 43/26, 43/27
U.S. Cl. 166—249 39 Claims



1. A method of well completion or workover of oil, gas or other fluid containing subsurface formations into which a well bore has been drilled, which comprises the step of

packing off said fluid containing subsurface formation from said well bore which is above said subsurface formation while providing controllable communication through tubing between said fluid containing formation and a wellhead at the surface of said well bore,

thereafter creating substantially instantaneously at least once a low pressure void or zone of rarefaction in that portion of the well bore which is in communication with said fluid containing subsurface formation but beneath said controlled communication in said tubing, and

creating a negative fluid pulse or surge of fluid from said subsurface formation into said created low pressure void or zone of rarefaction in said packed off portion of said well bore that is in communication with said fluid containing formation.

3,923,100

COMPOSITIONS USEFUL IN PLUGGING FORMATIONS

Thomas J. Bellos, Kirkwood, and Donald U. Bessler, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Sept. 28, 1973, Ser. No. 401,578
Int. Cl.² E21B 33/13, 43/26
U.S. Cl. 166—281 4 Claims

1. A process of plugging an earth formation comprising a petroleum-containing formation and a water-bearing forma-

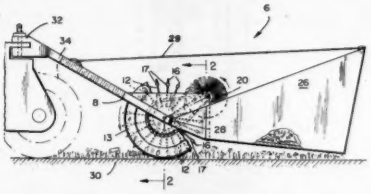
tion, said earth formation being in communication with a well, which comprises:

1. introducing into said well a preflush composition comprising a non-aqueous solution of a fatty amine acid salt, and
2. forcing said solution into the formation so that when said solution comes into contact with the water-bearing formation it will plug said water-bearing formation.

3,923,101
PIN CYLINDER LITTER COLLECTOR

Paul C. Donohue, 82-13 32nd Ave., Jackson Heights, N.Y. 11370

Filed Apr. 5, 1974, Ser. No. 458,281
Int. Cl.² A01B *43/00*
U.S. Cl. 171—63 **7 Claims**

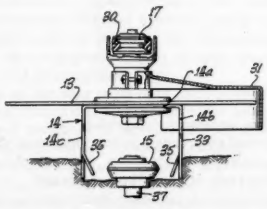


1. A litter picker comprising, in combination, a frame, a first horizontal shaft mounted in said frame, a pair of ground engaging wheels secured to the ends of said first shaft for causing said first shaft to rotate, means secured about said shaft for attaching a plurality of rods, a plurality of spaces flexible rods attached to said securing means radially of said shaft and having rod ends extending beyond the periphery of said wheels, a second shaft rotatably mounted in said frame rearwardly of said first shaft, a cylindrical brush secured to said second shaft for cooperation with said rods, means operably connecting both said shafts for driving said second shaft upon rotation of said first shaft, a bin for litter secured to said frame rearwardly thereof, said means secured about said first shaft for attaching said rods comprising a plurality of adjacent sleeves of flexible material mounted on said first shaft in frictional engagement with said shaft and a concrete cylinder enclosing said first shaft and said sleeves, said rods extending through said concrete cylinder and said plurality of adjacent sleeves respectively.

3,923,102
TOOL FOR EDGING AROUND SPRINKLER HEADS

Allen H. Morris, 3039 Glendon Ave., Los Angeles, Calif. 90034

Filed Jan. 21, 1974, Ser. No. 435,202
Int. Cl.² A01D *35/00*
U.S. Cl. 172—13 **4 Claims**

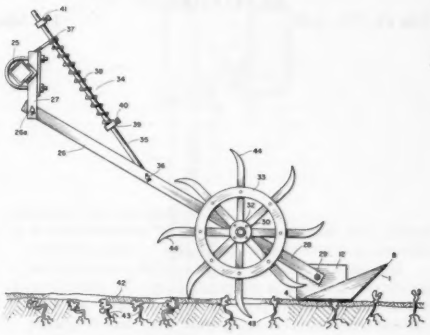


1. In a power-driven apparatus, including a carriage with wheels and a power motor on the carriage, a U-shaped edging blade for cutting a circular area in sod close around a lawn sprinkler head and means coupled to said power motor for turning said blade about a vertical axis, said blade being comprised of strap steel having a horizontal section of a length equal to the diameter of the circular area to be cut, said horizontal section being centered on said vertical axis and two end sections perpendicular to said horizontal central section, one end section extending downwardly from said horizontal section at each end thereof, and each end section having a leading edge for cutting and a trailing segment bent inwardly toward said vertical axis for breaking up sod being cut by the leading edge and for propelling sod thus cut and broken up away from the circular cut being made, whereby cut and broken up sod is propelled out and away from said circular area.

3,923,103
CULTIVATOR SKIMMER DEVICE

Jimmie L. Davis, Rte. 2 Box 126, and Alfred C. Harris, Jr., 408 C 15th St., both of Abernathy, Tex. 79311

Filed Dec. 2, 1974, Ser. No. 528,871
Int. Cl.² A01B *49/02, 39/26, 35/26*
U.S. Cl. 172—201 **10 Claims**



1. A cultivator skimmer which when viewed from directly overhead comprises:

a. a front shield-plate portion in the shape of a triangle, the vertex of which is at the front tip of the shield and the sidewardly extending halves of which angle downwardly from the proximity of a median line drawn from said vertex to the base line of said triangle, thus imparting to the front shield-plate portion a transverse cross-section in the shape of an inverted "V," and

b. a rear shield-plate portion which extends rearwardly from said first portion, said rear portion being closed at the top and having sides which extend downwardly to a distance which corresponds to that to which said halves of the triangular front portion extend downwardly, said sides being spaced apart at their lower edges and to each side of the longitudinal axis of the shield, and thus providing a channel between the sides.

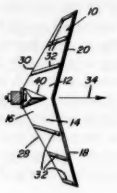
3,923,104
FORWARD ANGLE PLOW SWEEP

Robert C. Tibbs, Hospital Drive, Cleveland, Miss. 38732

Filed Oct. 18, 1974, Ser. No. 516,130
Int. Cl.² A01B *39/18, 39/26*
U.S. Cl. 172—730 **10 Claims**

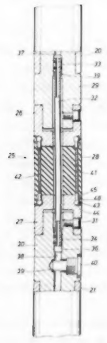
1. A plow sweep construction comprising a horizontal plate including opposite side marginal portions and front and rear marginal portions each having generally straight opposite end portions disposed on opposite sides of a center front-to-rear extending vertical plane disposed centrally intermediate the opposite side marginal portions of said plate, the central portion of the rear marginal edge portion of said plate including

means for support from the lower end portion of a dependingly supported tool shank, the opposite end portions of said



front marginal portions being slightly forwardly inclined toward their remote ends.

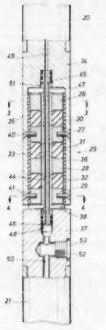
3,923,105
WELL BORE PERFORATING APPARATUS
Jack F. Lands, Jr., Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Dec. 4, 1974, Ser. No. 529,422
Int. Cl.[2] E21B *43/11*
U.S. Cl. 175—4.55 **11 Claims**



1. Perforating apparatus comprising:
first and second perforating guns cooperatively arranged to be sequentially actuated for successively perforating spaced intervals of a well bore wall; and
shock-absorbing coupling means tandemly intercoupling said perforating guns and including first and second spatially disposed rigid coupler members respectively coupled to said first and second perforating guns, and a yieldable coupler member of an elastomeric material cooperatively arranged between said rigid coupler members for attenuating shocks transmitted to one of said perforating guns upon actuation of the other of said guns.

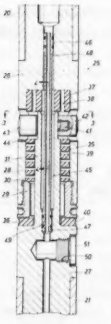
3,923,106
WELL BORE PERFORATING APPARATUS
Michel J. Bosse-Platiere, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Dec. 4, 1974, Ser. No. 529,418
Int. Cl.[2] E21B *43/11*
U.S. Cl. 175—4.55 **11 Claims**

1. Perforating apparatus comprising:
first and second perforating guns cooperatively arranged to be sequentially actuated for successively perforating spaced intervals of a well bore wall; and
shock-isolating means tandemly intercoupling said perforating guns cooperatively arranged for attenuating shocks transmitted to one of said perforating guns upon actuation of the other of said guns and including at least first



and second spatially-disposed rigid coupler members respectively coupled to said first and second perforating guns, and a yieldable coupler member cooperatively arranged between each of said rigid coupler members for isolating said rigid coupler members from one another.

3,923,107
WELL BORE PERFORATING APPARATUS
John W. Dillard, Magnolia, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Dec. 14, 1974, Ser. No. 529,419
Int. Cl.[2] E21B *43/11*
U.S. Cl. 175—4.55 **11 Claims**



1. Perforating apparatus comprising:
first and second perforating guns cooperatively arranged to be sequentially actuated for successively perforating spaced intervals of a well bore wall; and
shock-isolating means tandemly intercoupling said perforating guns cooperatively arranged for attenuating shocks transmitted to one of said perforating guns upon actuation of the other of said guns and including inner and outer rigid coupler members telescoped together and

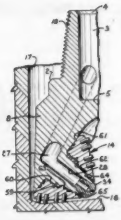
respectively coupled to said first and second perforating guns, and yieldable means cooperatively arranged between said rigid coupler members for shock isolating said rigid coupler members from one another and yieldably supporting said inner member within said outer member to accommodate relative longitudinal and bending movements therebetween.

3,923,108

DRILL TOOL

Edward B. Williams, Jr., P.O. Box 648, 103 Mullaney Road, Greenville, Tex. 75401

Filed Jan. 17, 1975, Ser. No. 541,860
Int. Cl.[2] E21B 9/10
U.S. Cl. 175—227 5 Claims



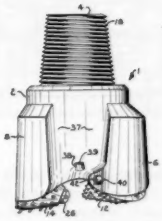
1. A drill tool comprising:
a. a body member having a passage therein, said passage extending along a longitudinal axis of said body member and between a fluid receiving end and a closed end;
b. a plurality of circumferentially spaced arms extending from said body member adjacent the closed end of said passage in said body member, said arms each having an inwardly facing surface;
c. a plurality of axle portions each exteding from the inwardly facing surface of a respective one of said arms and along a respective axis intersecting the longitudinal axis of said body member in a manner to define a respective acute angle between the axis of the respective axle portion and the longitudinal axis of said body member;
d. a plurality of cutting cones each rotatably mounted on a respective one of said axle portions and having a base surface in facing relation with the inwardly facing surface of the respective arm, said cutting cones each having cavity defining surfaces in engagement with respective exterior surfaces of said respective axle portions;
e. means on each of said axle portions for retaining lubrication material and for circulating same to the exterior surface thereof;
f. means on the cavity defining surfaces of each of said cutting cones for circulating lubrication material within the cavity thereof and thereby lubricating engaging surfaces of said cutting cones and axle portions;
g. a plurality of annular seal members each mounted on the base surface of a respective one of said cutting cones and in engagement with the inwardly facing surface of said respective arm for retaining the lubrication material between the engaging surfaces of said respective cutting cones and axle portions; and
h. means on the base surface of each of said cutting cones defining at least one recess therein for a respective one of said seal members to be mounted thereon, said means defining each of said recesses including:
1. an abutment surface extending substantially normal to the base surface of said respective cutting cone and positioned to be engaged by said respective seal member; and
2. a ramp surface intersecting the base surface of said respective cutting cone and positioned to define a ramp for outward movement of said respective seal member and toward said abutment surface in response to movement of said base surface of said respective cutting cone toward the inwardly facing surface of said respective arm.

3,923,109

DRILL TOOL

Edward B. Williams, Jr., P.O. Box 648, 103 Mullaney Road, Greenville, Tex. 75401

Filed Feb. 24, 1975, Ser. No. 552,447
Int. Cl.[2] E21B 9/10
U.S. Cl. 175—340 10 Claims



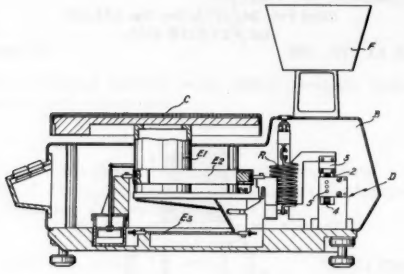
9. A drill tool comprising:
a. a body member having a passage therein, said passage extending along a longitudinal axis of said body member and between a fluid receiving end and a closed end;
b. a plurality of circumferentially spaced arms extending from said body member adjacent the closed end of said passage in said body member, each of said arms having a leading side and a trailing side;
c. a plurality of axle portions each extending from a respective one of said arms and along a respective axis intersecting the longitudinal axis of said body member in a manner to define a respective acute angle between the axis of the respective axle portion and the longitudinal axis of said body member;
d. a plurality of cutting cones each rotatably mounted on a respective one of said axle portions, said cutting cones each having surfaces in engagement with respective exterior surfaces of said respective axle portions;
e. a flow passage communicating with the passage in said body member and extending through one of said arms with an end portion of said flow passage extending along the axis of rotation of the cutting cone mounted on said axle portion of said one arm, the end portion of said flow passage through said one arm having an end positioned adjacent the bottom of the drill hole;
f. a nozzle member mounted in the end portion of said flow passage through said one arm;
g. means in said nozzle member for defining a first orifice positioned to direct the drilling fluid into a space between a first cutting cone and a second cutting cone in a manner to clear a space ahead of the second cutting cone;
h. means in said nozzle member for defining a second orifice positioned to direct the drilling fluid into a space between the second cutting cone and a third cutting cone in a manner to clear a space ahead of the third cutting cone; and
i. means in said nozzle member for defining a third orifice positioned to direct the drilling fluid into a space between the first cutting cone and the third cutting cone in a manner to clear a space ahead of the first cutting cone.

3,923,110

PRECISION DISPLACEMENT MEASURING DEVICE FOR AN ELECTRONIC READ-OUT PLATFORM SCALE

Felice Dal Dan, Rosny-sous-Bois, France, assignor to Etablissements Leonard S.A., Romainville, France

Filed Feb. 12, 1975, Ser. No. 549,439
Int. Cl.² G01G 3/14
U.S. Cl. 177—210 3 Claims



1. In a platform displacement scale comprising parallelogram linkage means for transmitting the scale platform displacement, a movable bridging arm arranged to be displaced by said linkage means in proportion to said scale platform displacement and read-out means, a precision displacement measuring device comprising:

flexible suspension means depending from said bridging arm, and

counting means having an electronic output connected for operating said read-out means, said counting means comprising:

a vertically movable member suspended from said bridging arm by said suspension means and including a grating of substantially horizontal lines;

a fixed member carrying a fixed grating in alignment with said grating of said movable member and provided with means for guiding said movable member, said guiding means including screw-adjustable means for minimizing the play of said movable member in its path of motion, and

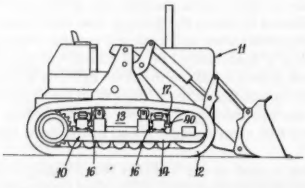
detecting means provided on said fixed member for producing electronic pulses in response to relative movement of said gratings.

3,923,111

MULTIDIRECTIONAL RESILIENT SUSPENSION FOR VEHICLES

Robert J. Purcell, Washington; David J. Balzer, East Peoria, and Rollin P. Van Zandt, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 1, 1974, Ser. No. 438,665
Int. Cl.² B62D 55/16
U.S. Cl. 180—9.54 4 Claims



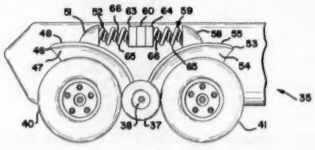
1. A resilient suspension system for a track-type vehicle having a main frame and a track roller frame including; a hollow tubular member, annular resilient means disposed around the exterior said tubular member for cushioning lateral movement between said main and roller frames, resilient pad means disposed in stacked relation within the hollow interior of said tubular member for cushioning vertical relative movement between said frames, including first coupling means for supportingly surrounding said annular resilient members and for mounting said annular resilient members and said tubular member upon said roller frame, bracket means secured to said main frame for supporting a portion of said tubular member for movement relative to said first coupling means.

3,923,112

DRIVEN WHEEL ARRANGEMENT

Muriel T. Goodgame, 305 W. Mesa, Hobbs, N. Mex. 88240

Filed Jan. 7, 1974, Ser. No. 431,547
Int. Cl.² B60G 5/06, 3/14
U.S. Cl. 180—24.11 17 Claims



1. A wheel suspension and driving system for a non-endless track type vehicle and comprising:

a. a generally horizontal driven axle mounted on a vehicle and supported by a frame thereof;

b. a driving member mounted on said driven axle and rotatable therewith;

c. a support member mounted for rotation substantially about the axis of said driven axle and having a hub spaced from said axis, said hub having an axis substantially parallel with said driven axis;

d. a vehicle supporting wheel rotatably mounted on said hub;

e. means operatively engaging said driving member for transmitting power from same to said vehicle supporting wheel to effect rotation thereof; and

f. resilient load support means engaging said support member, said resilient load support means being located above said support member and substantially coplanar with said vehicle supporting wheel, said load support means being in compression on a generally horizontal axis and resiliently urging said vehicle supporting wheel into ground contact.

3,923,113

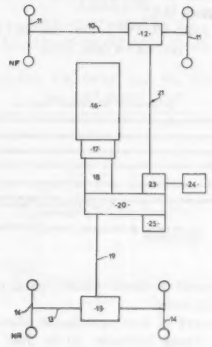
FOUR WHEEL DRIVE VEHICLES

Brian Colin Pagdin, Sutton Coldfield, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed June 21, 1973, Ser. No. 372,450
Claims priority, application United Kingdom, June 21, 1972, 28975/72; Aug. 26, 1972, 39897/72
Int. Cl.² B60K 17/34, 23/04
U.S. Cl. 180—44 R 8 Claims

1. A four-wheel-drive vehicle including a prime mover, front and rear wheels drivable by the prime mover, a drive connection between the front and rear wheels, a torque transmitting device having two relatively rotatable parts arranged so that the ratio of input torque to output torque of the device is not at all times equal to the ratio of output speed to input speed of the device, one of said parts of the device being connected with the front wheels and the other of said parts of the device being connected with the rear wheels so that when a speed differential arises between the front and rear wheels

said parts of the device rotate relative to each other to transmit torque between the parts thus diverting part of the prime mover torque from the faster rotating wheels to the slower rotating wheels, a normally disengaged clutch connected kinematically in parallel with the torque transmitting device so as to provide an alternative torque transmitting path between the front and rear wheels, and a temperature sensitive element



arranged, when the temperature of the torque transmitting device reaches a predetermined value resulting from relative rotation of said parts thereof in response to a speed differential between the front and rear wheels, to cause the clutch to engage, thus relieving the device of its torque transmitting duty and reducing the amount of energy converted into heat in the torque transmitting device.

3,923,114

SOUND ARRESTING DEVICE IN A VEHICLE FOR USE IN CONSTRUCTION WORK

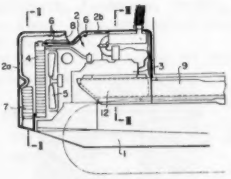
Yasuo Suzuki, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed July 2, 1974, Ser. No. 485,229

Claims priority, application Japan, Aug. 14, 1973, 48-90539

Int. Cl.[2] B60K *11/04*

U.S. Cl. 180—54 A **3 Claims**



1. A sound arresting device in a vehicle for use in construction work having a chasis, an engine compartment provided at the forward end of said chasis and formed with air suction openings, an engine housed in said engine compartment for driving said vehicle, fan means provided in said engine compartment for directing cooling air sucked in said engine compartment through said suction openings toward said engine to cool the same, and fender means extending longitudinally on either side of said chasis from said engine compartment to the rear end of said chasis, wherein the improvement comprises said engine compartment being formed in a closed construction except for said suction openings, a lining of sound absorbing material applied to the inner walls of said engine compartment except for said suction openings, each of said fender means being constructed in the form of a duct opening at its forward end into said engine compartment and at its rear end into atmosphere, with a lining of sound absorbing material applied to the inner wall of each said fender means, thereby permitting sound produced in said engine compartment and contained in said cooling air to be substantially attenuated by said linings in said engine compartment and said fender means before said cooling air is discharged from said fender means, wherein one of said suction openings is provided at the top of said engine compartment while the remaining suction openings are provided at either side of said engine compartment adjacent to the forward end thereof and are in the form of louvers having a plurality of blades, each of said blades being provided thereon with a lining of sound absorbing material.

3,923,115

HYBRID DRIVE

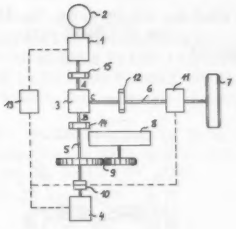
Juergen Helling, Nizzaallee 36, 51 Aachen, Germany

Filed Oct. 26, 1972, Ser. No. 301,154

Claims priority, application Germany, Oct. 29, 1971, 2153961

Int. Cl.[2] B60K *9/04*

U.S. Cl. 180—65 A **9 Claims**



1. A hybrid drive with at least two driving engines, among them at least one electric machine and at least one power source connected to the driving engines, a differential gearing means having three shafts, one of said three shafts being an output shaft, a brake coupled to said output shaft for restraining rotation thereof, said driving engines being coupled to said differential gearing means by the other two shafts of said three shafts, and the relationship between said other two shafts and said differential gearing means being one wherein when one of said other two shafts is driven in one direction and said output shaft is restrained by said brake against rotation the other of said two shafts is rotated in an opposite direction relative to said driven shaft, said electric machine being an electric generator-motor unit operable first as a generator with the speed of the driving thereof in said opposite direction decreasing to zero as said speed of said output shaft increases with said generator-motor unit thereafter functioning as a motor turning in said one direction and assisting in the driving of said output shaft, said differential gearing means being of the type for adding up the performance of said driving engines, a flywheel, and transmission gearing independently connecting said flywheel to at least one of said other two shafts.

3,923,116

ELECTRIC VEHICLE HAVING IMPROVED BATTERY RECONNECT

Francis T. Thompson, and James A. Bauer, both of Murrysville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 2, 1974, Ser. No. 430,107

Int. Cl.[2] B60L *11/18*

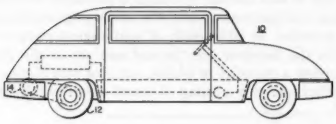
U.S. Cl. 180—65 R **14 Claims**

1. A method for switching the power batteries connection to the armature of the drive motor in an electric vehicle driven by a separately excited direct current motor from a low voltage connection to a high voltage connection wherein the

armature time constant is relatively short and the field time constant is relatively long comprising the steps of:

preventing current flow into the batteries;

increasing the current flowing through the separately excited field windings; and



completing the series connection of the batteries when field excitation reaches a predetermined level of approximately 100% of full field current.

3,923,117

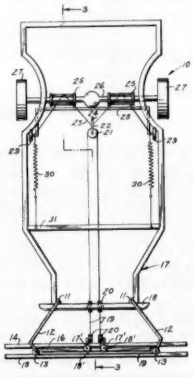
BUMPER ACTUATED GROUND ENGAGING BRAKE

Marcos E. Valdez, 1919 Fruitvale Ave., No. C, Oakland, Calif. 94601

Filed Jan. 23, 1974, Ser. No. 435,709

Int. Cl.[2] B60R *19/02*

U.S. Cl. 180—93 **4 Claims**



1. A bumper mechanism adapted for attachment to a vehicle having a chassis including side frames, rear wheels carried by axle means and being carried by said chassis and a front bumper, said mechanism comprising a pair of pivotable leaf members adapted to be hingeably carried upon the chassis of a vehicle, an endless cable pulley means carried by said leaf members for carrying an endless cable, a pair of front and rear guide bars extending transversely of said side frames forwardly of said bumper, providing guide means for said pulleys, a separator bar carried by and positioned between said guide bars for securing said bars together, a pair of pulleys carried by said guide bar for the horizontal mounting of said cable forwardly of said bumper, a second pair of vertical pulleys for carrying said cable, a horizontal rear pulley, a rear wheel lifting axle, spring means normally urging said axle into an inoperative position, a pair of spools carrying a second cable attached to the support of said horizontal pulley in the rear of said vehicle, said front and rear guide bars being supported by the mounting means of the pulleys attached to said leaf members, the opposite ends of said leaf members being supported hingeably between the side frames of said chassis rearwardly of said bumper, said pulleys of said leaves being guided towards the outside ends of said guide bars when impact occurs at the forward portion of said vehicle.

3,923,118

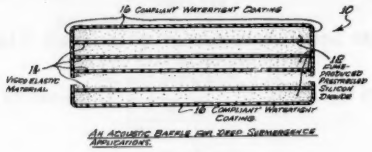
ACOUSTIC BAFFLE FOR DEEP SUBMERGENCE

Carl R. Johansen, La Verne, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 19, 1972, Ser. No. 263,893

Int. Cl.[2] C09K *3/00*

U.S. Cl. 181—.5 **6 Claims**



1. A multi-layered acoustic baffle, particularly useful at great depths, comprising:

at least two layers of fume-produced silicon dioxide, the particle size being between 70 to 500 angstroms, the particles being sintered together in chain-like formations and having surface areas of 50 m^2/g to 400 m^2/g;

each of the layers being prestressed to a pressure greater than the pressure at which the baffle is to be used; and

each of the layers having a thickness not greater than ¼ wavelength of the highest frequency of interest in the material;

at least one layer of high-density, viscoelastic material having a high acoustic shear loss coefficient, sandwiched in between each layer of the silicon dioxide; and

a layer of a compliant watertight coating bordering the two outer layers of silicon dioxide and the sides of the baffle, thereby completely enclosing the other layers.

3,923,119

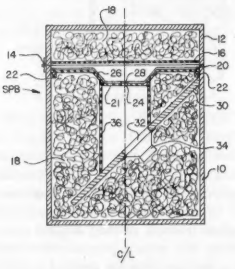
SOUND PRESSURE BOX

George Joseph Frye, 12175 SW. Douglas, Portland, Oreg. 97225

Filed Jan. 3, 1974, Ser. No. 430,463

Int. Cl.[2] G01V *1/00*

U.S. Cl. 181—.5 **6 Claims**



1. A sound pressure box comprising:

a top section;

a bottom section;

means connecting said top section and said bottom section together;

sound-absorbing material disposed in said top section and said bottom section;

device-holding means mounted in said bottom section;

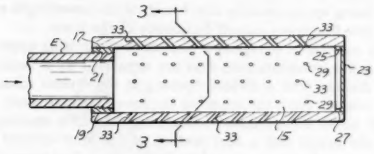
mounting means disposed in said bottom section extending between an upper end of said bottom section and an opposed inner end thereof; and

sound-generating means mounted on said mounting means so that the axis thereof is at an angle with respect to the vertical axis of said box.

3,923,120
EXHAUST SILENCER

Joseph M. Jatcko, 15555 E. 12 Mile Road, Roseville, Mich. 48066

Filed Feb. 18, 1975, Ser. No. 550,212
Int. Cl.² F01N *1/08*
U.S. Cl. 181—60 **8 Claims**



1. An exhaust silencer for gases comprising a hollow elongated cylindrical body with a uniform bore;

an inlet at one end of the body adapted to receive an exhaust pipe;

a cap anchored at and across the other end of the body;

a plurality of spaced rows of outlet holes formed through the body;

said holes inclined at an acute angle to the body axis;

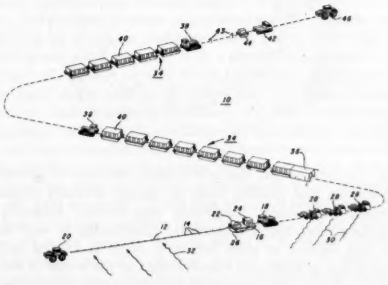
the holes of one row extending forwardly and outwardly, and the holes of an adjacent rows extending rearwardly and outwardly;

said rows of holes alternating in direction and extending around the body and substantially throughout its length, whereby exhaust gases passing said inlet move along the length of the body and escape through the rows of holes therein.

3,923,121
TOWED LAND CABLE

John A. Kruppenbach, Anchorage, Alaska, and John W. Bedenbender, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 75,391, Sept. 25, 1970, abandoned. This application Sept. 9, 1974, Ser. No. 504,591
Int. Cl.² G01V *1/16*
U.S. Cl. 181—112 **5 Claims**



1. A method of mechanized land prospecting comprising:

a. locating a segment of a line of exploration through an exploration area;

b. surveying with a mobilized survey unit the segment of the line of exploration to mark locations for seismic sources and a sensor land cable position while scouting location of additional segments of the line of exploration;

c. positioning mobile seismic sources at their marked locations along the segment of the line of exploration while surveying further positions along the additional segments of the line of exploration;

d. towing the land cable to its marked position along the segment of the line of exploration while surveying further positions along the additional segment of the line of exploration;

e. actuating the seismic sources to operatively produce acoustic disturbances in the earth;

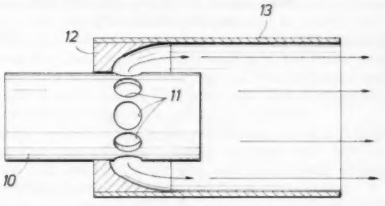
f. sensing along the segment of the line of exploration reflected acoustic waves for information pertaining to earth structure beneath the surface; and

g. relocating the mobile seismic sources at additionally marked seismic source locations, while towing the sensor-land cable to additionally marked locations along an additional segment of the line of exploration.

3,923,122
SEISMIC PNEUMATIC ENERGY SOURCE WITH ATTENUATION OF BUBBLE PULSE AMPLITUDE AND REDUCTION OF PERIOD OF BUBBLE OSCILLATION

Oswald A. Itria, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 220,940, Jan. 26, 1972, abandoned. This application Nov. 1, 1973, Ser. No. 411,986
Int. Cl.² G01V *1/04, 1/38*
U.S. Cl. 181—115 **8 Claims**



3. A method for attenuating the amplitude and reducing the period of bubble pulses resulting from the rapid expansion of pressurized air exiting from a plurality of exhaust ports of an air gun when generating a primary seismic energy pulse comprising the step of,

a. deflecting the expanding air from all exhaust ports with a cylinder having a length greater than its diameter into one direction for forming the bubble into an elongated shape.

3,923,123
SOUND REPRODUCING APPARATUS

Laurence Latimer-Sayer, Greenways, 122, Strawberry Vale, Twickenham, Middlesex TW1 4SH, England

Filed Nov. 6, 1973, Ser. No. 413,290
Claims priority, application United Kingdom, Nov. 10, 1972, 51918/72; Dec. 11, 1972, 57030/72; Jan. 19, 1973, 2804/72
Int. Cl.² H05K *5/00*
U.S. Cl. 181—144 **12 Claims**

1. Sound reproducing apparatus comprising:

a cabinet (10) defining at least a first chamber (13) therein, said cabinet (10) having a front face (10*a*) and a rear face (10*b*);

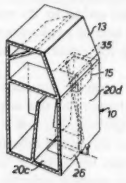
a single low frequency drive unit (11) which is mounted in said first chamber (13) on said front face (10*a*) of said

cabinet (**10**), said chamber (**13**) extending rearwardly of said low frequency drive unit (**11**);

at least a treble unit (**12**), mounted on said front (**10***a*) face of said cabinet (**10**);

a first port (**15**) in said cabinet (**10**) for the emission of low frequency sound;

a four section transmission line (**20***a*, **20***b*, **20***c*, **20***d*) formed within said cabinet (**10**) and extending between said chamber (**13**) and said first port (**15**);



a second port (**26**) in said cabinet (**10**) in communication with the third section (**20***c*) of said transmission line; and an adjustable first flap (**25**) in said cabinet and selectively movable between first and second positions for respectively opening and closing said second port (**26**) whereby in said first position said first flap (**25**) opens said second port (**26**) to isolate the last section of said transmission line (**20***d*) from the previous transmission line section (20*c*) and in said second position said first flap (**25**) closes said second port (**26**).

3,923,124

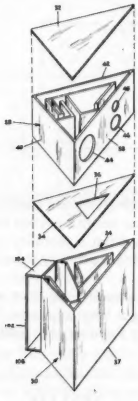
BACK LOADED FOLDED CORNER HORN SPEAKER

John P. Hancock, 2374 Post, NE., Belmont, Mich. 49306

Filed Jan. 2, 1974, Ser. No. 429,514

Int. Cl.[2] **H05K** *5/00*

U.S. Cl. 181—156 **22 Claims**



1. A back loaded, folded corner horn speaker comprising: a corner speaker enclosure having a front and a back and an open interior and including:

a front panel having at least one baffle opening therein;

a pair of side panels connected to opposite side edges of the front panel and converging inwardly therefrom to the back of the speaker enclosure, said back comprising a horn outlet therein, said side panels being formed such that when the speaker is placed in the corner of a room with the side panels facing the walls of the room, said side panels are spaced from the walls of the room such that the space between the side panels and the walls forms the final segment of a folded horn fitted in the enclosure; and

a top and a bottom enclosing open ends of the speaker enclosure;

a low frequency driver having a front and back and mounted in the baffle opening such that the front of the low frequency driver radiates directly outwardly from the speaker enclosure into the room and the back of the low frequency driver radiates into the interior of the speaker enclosure;

a folded hyperbolic-exponential horn fitted in the interior of the speaker enclosure so as to back load the back of the low frequency driver, said horn extending from a horn throat acoustically connected to the back of the low frequency driver to the horn outlet at the back of the speaker enclosure, said horn thereafter extending through a final segment of the horn formed along the outer surfaces of the side panels to a horn mouth at the front of the speaker enclosure, the length of said horn being approximately one-fourth of the wavelength of the low frequency cut-off frequency of the horn;

the interior of the speaker enclosure comprising upper and lower compartments that are separated by a horizontal divider, with a divider opening in the divider forming a passage from the upper to the lower compartment;

the upper compartment comprising the baffle opening and the driver and a first section of the horn formed by a series of interconnected partitions extending between the top and the divider, said first section of the horn extending from the throat connected to the back of the low frequency driver to the divider opening leading to the lower compartment; and

the lower compartment comprising the horn outlet and a second section of the horn formed by partitions extending between the divider and the bottom, said second section of the horn extending from the divider opening to the horn outlet of the enclosure.

3,923,125

APPARATUS FOR THE CONTROLLED FEEDING OF LUBRICANTS AND COOLANTS TO ROTATING SURFACES IN CONTACT

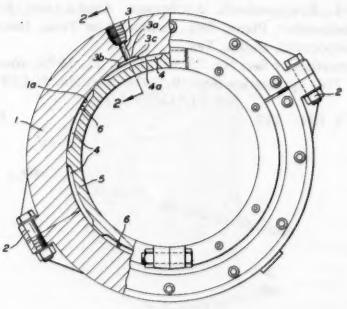
Erich Rosenthal, Sandheider Strasse 201, 5605 Hochdahl, Germany

Filed Aug. 28, 1973, Ser. No. 392,230

Claims priority, application Germany, Aug. 28, 1972, 2242229; Mar. 21, 1973, 2325624

Int. Cl.[2] **F01M** *1/00*

U.S. Cl. 184—6 **12 Claims**



1. Apparatus for the controlled delivery of pressurized lubricating and cooling fluid to distant surfaces rotating in contact comprising: stationary ring means, rotatable ring members mounted in concentric relationship to said stationary ring means, at least two feed ducts in one of said ring means and at least one transfer duct in the other of said ring means, at least two axially spaced chamber means disposed about a portion of the periphery of one of said ring means and communicating with said feed ducts, and at least two duct

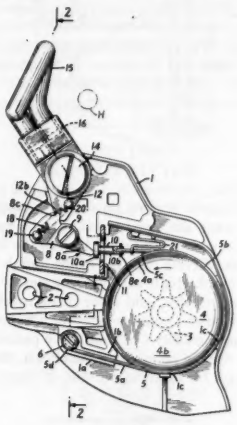
means circumferentially disposed about the periphery of the other of said ring means and communicating with said transfer duct, whereby the flow of the pressurized fluid from said transfer duct to distant surfaces rotating in contact is selectively fed from said chamber means to said duct means in quantities determined by the relative areas of said chamber means and said duct means.

3,923,126

BAND TYPE BRAKE FOR A CHAIN SAW

Edward J. Bidanset, Amawalk, N.Y., assignor to Textron Inc., Providence, R.I.

Filed June 25, 1974, Ser. No. 483,034
Int. Cl.[2] F16D 49/04
U.S. Cl. 188—77 W 11 Claims



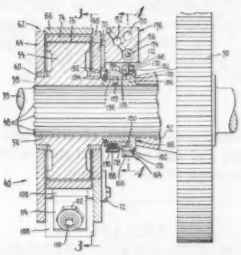
1. In a chain saw having a rotatable drum and a coaxial chain-driving sprocket rotationably fixed relative to the drum; a chain brake for stopping the cutting chain of the chain saw quickly, comprising a brake band engageable with said drum, means anchoring one end of said brake band, said band extending around said drum from said anchoring means in the direction of rotation of the drum, operating means at the other end of said brake band and movable between a brake releasing position in which said operating means acts on said band to release the drum for rotation and a brake applying position in which said brake band engages the drum and thereby applies a braking effect to the drum, and inertial means operatively associated with said operating means and responsive to predetermined acceleration of the chain saw to cause movement of said operating means from brake releasing position to brake applying position and thereby apply a braking effect to the drum, said operating means comprising a first rotatable member having an abutment and operable to act on said other end of said brake band to move it in a direction opposite to the direction of rotation of said drum to thereby disengage said brake band from said drum when said operating means is moved to brake releasing position, and said inertial means comprising a second rotatable member operatively associated with said first rotatable member to control its movement from brake releasing position to brake applying position, said second rotatable member having an abutment which is engageable with said abutment of said first rotatable member to move said first rotatable member from brake applying position to brake releasing position and to retain it in brake releasing position until operation of said inertial means to apply the brake, and a spring acting between said first rotatable member and said second rotatable member to bias said members to whichever position they are in and thereby tending to retain them in such position.

3,923,127

VEHICLE BRAKING SYSTEM

Stanley L. Radcliffe, Stow, Ohio, and Arthur E. Dornan, Ann Arbor, Mich., assignors to Massey-Ferguson, Inc., Detroit, Mich.

Division of Ser. No. 227,836, Feb. 22, 1972, Pat. No. 3,819,016. This application Mar. 21, 1974, Ser. No. 453,658
Int. Cl.[2] F16D 63/00
U.S. Cl. 188—82.1 8 Claims



1. In a vehicle having a drive member for transmitting power to ground engaging members from an engine for driving the vehicle relative to the ground, a control system comprising:

means for interrupting movement of the drive member mounted on the drive member;

a linkage operatively associated with said interrupting means, a member of said linkage supported by the drive member so as to be rotatable over a portion of the 360° rotation of the drive member in response to reverse motion of the drive member corresponding to reverse motion of the vehicle, said linkage including a link and a pivotal arm, two ends on said pivotal arm, one end of said pivotal arm being pivotally connected to said linkage and to said link at spaced locations, said link limiting the rotational movement of said linkage member;

means for operatively engaging said linkage, having at least a portion thereof stationary for engaging said link, to cause said linkage to energize said interrupting means preventing further movement of the drive member;

means for actuating said linkage attached to the other end of said pivotal arm;

means for controlling said system; and means for positioning at least a portion of said control means, said positioning means being mounted on the drive member and responsive to reverse movement of the vehicle, said actuating means energized by said control means through reverse movement of said positioning means to cause said linkage to energize said interrupting means by engagement with said engaging means.

3,923,128

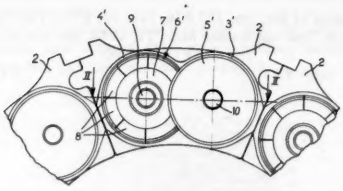
DISC BRAKE WITH GRAPHITE FRICTION SHOES

Rene Lucien, Neuilly-sur-Seine, and Jean Masclet, Paris, both of France, assignors to Messier Hispano, Paris, France

Filed Feb. 7, 1974, Ser. No. 440,575
Int. Cl.[2] F16D 69/02
U.S. Cl. 188—251 A 6 Claims

1. A disc brake comprising an alternating arrangement of rotors and stators, each including a plurality of sectors, each sector being provided with sockets with graphite friction shoes fixed in said sockets, at least one portion of each of an adjacent rotor and stator comprising roughening elements distributed in said portion such that when the rotors rotate, said roughening elements rub on the surface of the shoe in the adjacent confronting socket, said roughening elements comprising a plurality of separate elements respectively accomodated with its associated shoe in a common respective

socket, said plurality of separate elements being arrayed at least as a portion of a ring which is concentric with its respec-



tive shoe and attachment means securing said plurality of separate elements and said associated shoe within said common socket in secured relation therein.

3,923,129

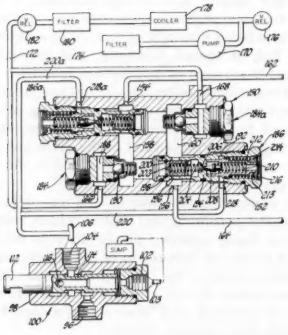
CONTROL FOR HYDROSTATIC TRANSMISSION AND BRAKE

Allan C. Rusch, Livonia, and John Bubak, Warren, both of Mich., assignors to Massey-Ferguson, Inc., Detroit, Mich.

Continuation of Ser. No. 194,255, Nov. 1, 1971, abandoned. This application Mar. 25, 1974, Ser. No. 454,331

Int. Cl.[2] B60K *29/02;* **F16D** *31/02*

U.S. Cl. 192—4 B **5 Claims**



1. A speed control apparatus for controlling a hydrostatic transmission over a range of speed conditions including a zero speed condition comprising a hydrostatic drive and an output means, a braking circuit with a brake for applying braking pressure to said output means only upon said transmission attaining said zero speed condition characterized by said braking circuit having a mechanism comprising: a support, a lever pivotally mounted at one end on said support for movement between locking and unlocking positions; a recess in said lever; a follower on said drive having a position corresponding to each speed condition of said drive and being only engageable with said recess in the zero speed condition and an extendible and retractable plunger engageable with said lever and extendible for energization of said braking circuit.

3,923,130

HYDRODYNAMIC BRAKING DEVICE

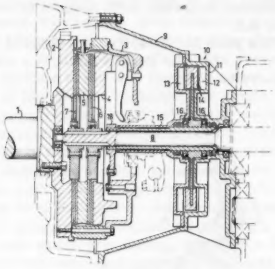
Erik Per-Olof Eker, Goteborg, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed May 13, 1974, Ser. No. 469,681

Claims priority, application Sweden, May 15, 1973, 73068595

Int. Cl.[2] B60K *41/24;* **F16D** *57/02*

U.S. Cl. 192—12 A **2 Claims**



1. A hydrodynamic braking device for motor vehicles having an engine crank shaft and a clutch and a gear box driven by a drive pinion which in turn is driven by the driven member of the clutch, the driving member of the clutch being secured to the engine crank shaft, said braking device comprising a stator frame and a rotor, said rotor being rotatably mounted in the stator frame and being secured to a hollow shaft which is mounted concentrically with said drive pinion and which is secured to the driving member of the clutch, the hollow shaft securing the rotor for rotation with the driving member of the clutch.

3,923,131

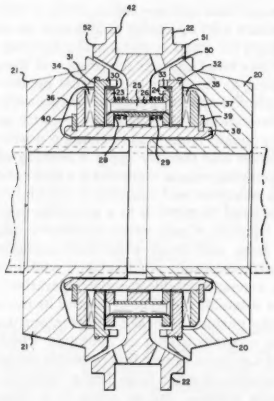
SHIFT RING FOR A MARINE CLUTCH

Robert L. La Follette, Baldwinsville, N.Y., assignor to American Challenger Corporation, Fulton, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,491

Int. Cl.[2] F16D *21/04, 11/06, 19/00;* **F16H** *3/08*

U.S. Cl. 192—21 **5 Claims**



1. In a clutch mechanism of the type comprising:

an input shaft having first and second oppositely threaded driving spiral threads thereon, an output shaft, forward and reverse driving gears rotatably mounted on said input

shaft, each of said gears having a clutch surface, an output gear affixed to said output shaft and engaged with said driving gears, and first and second clutch elements each having threads which respectively match said first and second driving spiral threads, each having a clutch surface respectively mating with the clutch surface of said forward and reverse driving gears, an improved shifting mechanism comprising:

a dynamic shift ring movable axially by a shift linkage, said input shaft passing axially through said ring, said ring being disposed between said first and second clutch elements,

a static shifting element carried axially by said ring into engagement with the inner radial surface of a clutch element, and

a spring between said ring and said static shift element, axial movement of said ring initially bringing said static shift element into contact with a clutch element, further axial movement of said ring bringing it into contact with an outer radial surface of a clutch element to slow the rotation of said element on said input shaft whereby the spiral threads drive said element in the axial direction into clutch engagement or disengagement.

3,923,132

FRICTION CLUTCH

J. P. L. van der Klugt, Veghel, Netherlands, assignor to Sperry Rand Corporation, Blue Bell, Pa.

Filed June 18, 1974, Ser. No. 480,429
Int. Cl.² F16D *41/06*
U.S. Cl. 192—45.1 **4 Claims**

1. A one-way clutch comprising:

an outer body defining a cylindrically-shaped cavity having a cavity surface, said outer body being rotatable about an axis;

a inner body situated in said cavity, said inner body being spaced from said cavity surface so as to form a gap therebetween, said inner body being rotatable about said axis, and said inner body having a notch in the outer surface thereof, said notch being bounded by first and second surfaces, said first surface being more nearly radially disposed then said second surface; and

a resilient, flexible-strip gripping member being at least as thick as said gap, said flexible-strip gripping member being attached to said shaft and being disposed in said notch so as to extend through said notch beyond the outer surface of said inner body until an outer tip thereof contacts the cavity surface, said flexible-strip gripping member being located so that it is urged against said first surface in one mode of operation of said one-way clutch but it is free to flex away from said first surface during another mode of operation of said clutch;

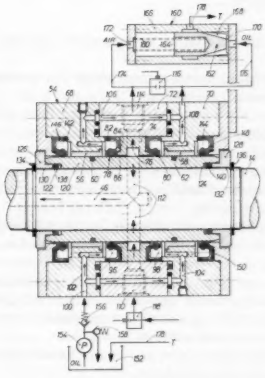
whereby, when said inner and outer bodies are relatively rotated in a first direction said contact of said flexible-strip gripping member with said cavity surface urges said flexible-strip gripping member against said first surface and a tip portion thereof becomes wadded in said gap between said inner and outer bodies to tend to prevent relative rotation between them, and when said inner and outer bodies are rotated in a second direction said contact of said flexible-strip gripping member with said cavity surface urges said flexible-strip gripping member away from said first surface toward said second surface, so that the tip thereof brushes lightly along said inner surface of said cavity to allow said relative rotation.

3,923,133

ROTARY SPEED FOR SUPPLYING FLUID PRESSURE TO A CLUTCH

Ilie Chivari, Berliner Str. 1, 468 Wanne-Eickel, Germany

Filed June 14, 1974, Ser. No. 479,220
Claims priority, application Germany, June 16, 1973, 2330750; Sept. 1, 1973, 2344165
Int. Cl.² F16D *25/00*
U.S. Cl. 192—85 R **20 Claims**



1. In a pneumatically engageable clutch for coupling a rotating shaft with a rotatable member, comprising:

a pneumatically operated, clutch engaging actuator means, mounted to rotate with said rotating shaft,

a compressed air passage extending through said shaft, said compressed air passage having an inlet and outlet, said outlet being connected to said actuator means, and

means for supplying compressed air from a stationary external source to said inlet of said compressed air passage, the improvement

wherein said inlet of said compressed air passage forms an orifice in the cylindrical surface of said shaft

and wherein said compressed air supplying means comprises:

a stationary casing surrounding said shaft and forming an annular chamber adjacent said inlet orifice of said compressed air channel and open towards said shaft,

radially-acting substantially air-tight shaft sealing means provided between said casing and said rotating shaft on both sides of said annular chamber,

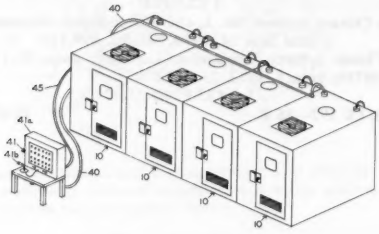
means for exposing the sides of said shaft sealing means remote from said annular chamber to hydraulic pressure exerted by a liquid,

and control means for controlling said hydraulic pressure as a function of the pressure of the compressed air inside said annular chamber to limit the pressure difference acting on said shaft sealing means.

3,923,134
REST ACCOMMODATION COMPARTMENT AND COMPLEX

Reza Rezazadeh, Box 12, Rte. 4, Platteville, Wis. 53818

Filed Sept. 26, 1974, Ser. No. 509,545
Int. Cl.² G07F 5/10
U.S. Cl. 194—9 T 2 Claims



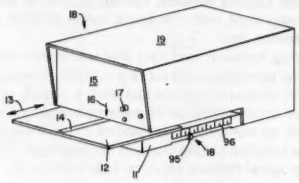
1. A rest accommodation compartment complex, comprising:
   A. a plurality of rest accomodation compartments, each compartment comprising:
      1. a generally rectangular enclosure having front, floor and ceiling panels;
      2. a door in said front panel;
      3. warning signal means for providing a signal to a user inside each of said compartments when supplied with electrical power;
      4. occupancy control means for maintaining said door normally locked, said occupancy control means including,
         a. coin operated means for receiving coins deposited by a compartment user from outside of said enclosure and unlocking said door in response to the deposit of a preselected value of coins,
         b. means operable by a user from inside said enclosure for locking said door,
         c. means for receiving coins deposited by a user inside each of said compartments,
         d. means for metering and visually indicating the allotted time remaining to a user determinable by the value of coins received from the user inside each of said compartments, and
         e. means for providing electrical power to said warning signal means when the user's allotted time has expired and said occupancy control means is itself supplied with electrical power; and
   B. detection means for detecting the presence of a user in said rest accommodation compartments and for providing a signal at a central control unit remote from said compartments to indicate which of said compartments is occupied.

3,923,135
MULTIPLE COPY SEVEN-SEGMENT IMPACT PRINTER

Merle A. Holman; Michael B. Holman; Donald K. Stephens, and William C. Hess, all of Oakdale, Calif., assignors to Holman Industries, Inc., Oakdale, Calif.

Filed Nov. 13, 1974, Ser. No. 523,460
Int. Cl.² B41J 1/00
U.S. Cl. 197—1 R 14 Claims

1. An impact printer comprising:
   a. a flat base plate having parallel major surfaces;
   b. a plurality of solenoids having parallel axes mounted in an array on one major surface of said base plate with their axes normal thereto;
   c. a plurality of generally U-shape stylus members each comprising a pair of parallel legs joined by a bight portion, one of said legs including a solenoid armature member and the other of said legs terminating at its free end in an impact printing surface; and
   d. a platen member having a flat surface mounted on one side of said array of solenoids with said flat surface thereof facing said base plate member and the plane thereof parallel to said major surfaces of said base plate member, said platen member being mounted for reciprocal movement in said plane of said flat surface thereof;
   e. said base plate member having a plurality of apertures therethrough spaced from each other about the center of said array of solenoids;

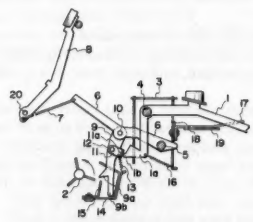


   f. said plurality of generally U-shape stylus members each having said one of said legs thereof in operative relation to a different one of said plurality of solenoids and said other of said legs thereof received through a different one of said apertures through said base plate member; whereby upon energization of one of said plurality of solenoids, the impact printing surface on said free end of said other one of said legs of the associated one of said plurality of U-shape stylus members will be accelerated toward said flat surface of said platen.

3,923,136
POWER DRIVEN TYPEWRITER

Nobuyoshi Nakajima, 5, Hakozakicho 4-chome, Nihonba, Chyuoku, Tokyo 103, Japan

Filed Sept. 14, 1973, Ser. No. 397,251
Int. Cl.² B41J 23/08
U.S. Cl. 197—17 3 Claims



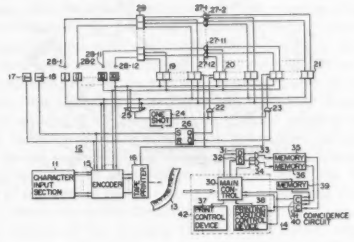
1. A power driven typewriter comprising a frame; a casing; a key lever having a downwardly bent portion at one end thereof in the form of an inverted L, said key lever being pivotally mounted to said frame and being pivotable between an actuating position and an at rest position; an actuating lever pivotally mounted to said frame adjacent said key lever; a type lever pivotally mounted to said frame and being pivotal between an at rest position and a type producing position; linkage means connecting said actuating lever and said type lever to produce pivotal movement of said type lever from said at rest position to said type producing position upon pivotal movement of said actuating lever from an at rest position to an actuating position; a third lever hanging freely from said actuating lever; a drum member mounted to said frame and having vanes carried by said drum to be rotatably movable therewith, said third lever having a jut portion movable into the path of said vanes of said drum member; means biasing said third lever to a position in which said jut member is

spaced from said vanes, said third lever having an angle piece pivotally mounted thereteo intermediate said actuating lever and said jut portion in a position to be engaged by said downwardly bent portion of said key lever upon pivotal movement of said key lever from said at rest position to an actuating position, movement of said key lever to said actuating position being operable to move said jut portion of said third lever into engagement with said vanes to thereby pivot said actuating lever from said at rest position to said actuating position, said downwardly bent portion of said key lever having a recessed portion adapted to receive said angle piece after engagement of said jut portion of said third lever with the vanes of said drum member to permit said jut member to be spaced from said vanes until said key lever is returned to said at rest position.

3,923,137
INFORMATION RECORDING APPARATUS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1974, Ser. No. 456,281
Claims priority, application Japan, Apr. 5, 1973, 48-38221; Apr. 5, 1973, 48-38222; Apr. 5, 1973, 48-38223
Int. Cl.² B41J *5/30*
U.S. Cl. 197—19 **6 Claims**



1. An automatic information recording apparatus comprising:

an input device for recording on a tape-shaped recording medium first encoded printing position designating information used to define the first and last printing positions of a single line in order to define a printing format, and then for recording on said tape-shaped recording medium encoded character information continuously regardless of the defined printing format;

means for successively reading out the printing position designating information and the character information both recorded on the tape-shaped recording medium;

first memory means coupled to said reading-out means for storing the printing position designating information read out by said reading-out means;

a printing device coupled to said reading-out means for printing on a recording paper the character information read out by said reading-out means;

second memory means for storing the last printing position of each line printed by said printing device;

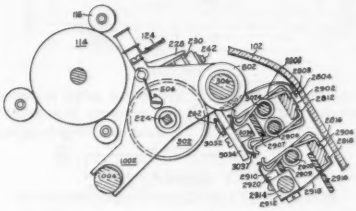
a comparator coupled to said first and second memory means for comparing the content of the second memory means with that of the first memory means; and

means coupled to said comparator for automatically controlling the defined printing format in response to the output of the comparator.

3,923,138
PRINTER WITH CODE-CONTROLLED TABULATOR STRUCTURE

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn. 06840

Division of Ser. No. 581,020, Sept. 21, 1966, Pat. No. 3,534,847. This application Sept. 2, 1970, Ser. No. 69,103
Int. Cl.² B41J *21/04*
U.S. Cl. 197—179 **9 Claims**



1. In a printer having means for producing printing along a writing line on a recording material supported thereat, the combination including:

A. positioning means to provide incremental relative motion between said printing means and said material;

B. format control means cooperable with said positioning means to effect tabular positioning of said material in relation to said printing means;

C. a tab-position memory having an array of position-defining means each of which can be conditioned to a set state or a cleared state such that each set position-defining means defines a tabular position;

D. code-signal responsive means to effect conditioning of said position-defining means to set and cleared states; and

E. memory readout means responsive to said relative motion for serially scanning said array to sense and provide an electrical output signal for each set position-defining means sensed as it occurs in metered relationship to said incremental relative motion, said output signal serving to effect termination of tabulation by said control means subsequent to the initiation of tabulation by an input signal to said control means.

3,923,139
DEVICE FOR ACQUISITION, STORAGE AND ECHELON OF CHARACTERS IN A PRINTER OF THE SERIES TYPE

Paul Mesnil, 4 Allee des Cedres, 91 Boussy St Antoine; Jean-Pierre Talvard, 40 Avenue Paul Claudel, 91 St Germain les Corbeil, and Bernard Flaceliere, 13, Allee des Elfes, 94 Fresnes, all of France

Continuation-in-part of Ser. No. 363,737, May 24, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 497,150
Claims priority, application France, May 25, 1972, 72.18601
Int. Cl.² B41J *5/00*
U.S. Cl. 197—19 **4 Claims**

1. A control unit for controlling a printer (P) of the type comprising a print logic (12) having a data input, a constant drive mechanism (11), an anvil (2) and a printing head (1), selectively driven by said mechanism through energization of a clutch (10), parallel to said anvil and automatically returned to a rest position upon deenergization of said clutch by means of a biasing device (6), said control unit being inserted between said data input and said print logic, and comprising:

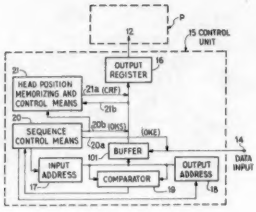
a register (16,314), having an output coupled to said print logic, and an input, for storing momentarily a single data;

a buffer (101, 301) having an input line for sequentially receiving digitally coded data and an output line for sequentially transmitting digitally coded data to said register;

buffer input address means (17) permanently defining the address in the buffer of the last character entered on said input line;

buffer output address means (18) permanently defining the address in the buffer of the first character which is ready for transfer on said ouput line;

comparator means (19) permanently comparing said first mentioned address with the buffer maximum address and with said second mentioned address;



sequence control means (20) authorizing, depending on the result of said comparison, the entry of a character on the input line or the transfer of a character on the ouput line; means for memorizing the position reached by the printing head each time the said addresses coincide, for then controlling the return of the printing head at the rest position, and for controlling, when new characters are entered after such a coincidence, a rapid space motion of the printing head along the anvil until the said memorized position is passed.

3,923,140

TYPEWRITER CARRIAGE DECELERATOR

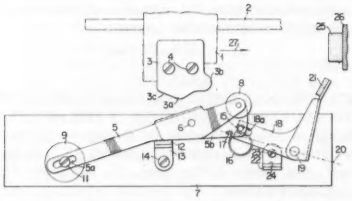
Kyuhachiro Iwasaki, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 8, 1974, Ser. No. 468,076

Claims priority, application Japan, May 14, 1973, 48-53325

Int. Cl.[2] B41J *19/02*

U.S. Cl. 197—64 **10 Claims**



1. A mechanism for decelerating a body movable in a predetermined direction, comprising:

a first member pivotal about a fixed point between a first position in which the body engages with a part of the first member and a second position in which the body clears the first member during movement of the body in the predetermined direction;

a second member pivotal about another fixed point between a first position in which the body clears the second member and a second position in which the body engages with a part of the second member during movement of the body in the predetermined direction, the first and second members being connected together so that when the first member is in its first position the second member is in its first position and when the first member is in its second position the second member is in its second position; and

overcenter biasing means to urge the first member toward its first and second positions from an overcenter position between the first and second positions, the first and second members being initially in their respective first positions and the body engaging during its movement in the predetermined direction with the part of the first member to pivot the first member past its overcenter position to its second position and thereby move the second member to its second position, the body engaging subsequently with the part of the second member to pivot the second member to its second position and thereby the first member past its overcenter position to its second position.

3,923,141

DUAL FEED RATE RIBBON MOUNTING AND TRANSPORT ASSEMBLY

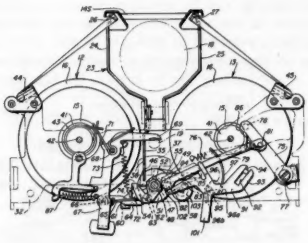
Hans-Georg Hengelhaupt, Nuremberg, Germany, assignor to Triumph Werke Nurnberg, A.G., Nuremberg, Germany

Filed July 1, 1974, Ser. No. 484,621

Claims priority, application Germany, July 21, 1973, 2337191

Int. Cl.[2] B41J *33/36*

U.S. Cl. 197—151 **6 Claims**



1. A ribbon support and ribbon feed assembly comprising a support plate,

vibrator means pivotally mounted on said support plate and couplable to an oscillatable drive pin when the assembly is mounted for operation in a typewriter,

a prewound ribbon supply spool and a take-up spool rotatably mounted on said support plate with ribbon extending between spools threaded through said vibrator means,

a rotatable transport roller responsive to the movement of said vibrator means for incrementally rotating said take-up spool,

means for sensing the diameter of wound ribbon on said take-up spool,

means coupled to said sensing means for decreasing the angle through which said rotatable means is rotated by said vibrator means to maintain incremental advance of ribbon through said vibrator constant,

a coiled spring clutch wrapped around said transport roller having an end extending radially therefrom,

means for initially positioning said spring end in the path of and spaced a predetermined distance from said vibrator means, said spring being operable when engaged and driven by said vibrator means to rotate said transport roller an amount determined by the spacing between said spring end and said vibrator means,

said take-up spool having a flange,

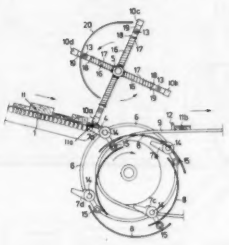
and means coupling said transport roller to peripherally drive said spool flange.

3,923,142

METHOD AND APPARATUS FOR DOSAGE OF SAWN TIMBER

Alpo Rysti, Frisansintie 22, 02240 Frisans, Finland

Filed May 29, 1974, Ser. No. 474,248
Claims priority, application Finland, June 6, 1973, 1838/73
Int. Cl.² B65G *47/00*
U.S. Cl. 198—25 6 Claims



1. Method for dosage of sawn, oblong pieces of timber from a feed conveyor onto a continuation conveyor to follow each other at fixed intervals, comprising feeding the timber pieces to be dosed in a direction transverse to their longitudinal direction, the timber pieces lying one after the other as a continuous mat; moving supporting arms along a closed path between the feed and continuation conveyors at a speed synchronous with the continuation conveyors; moving pressing members between the feed and continuation conveyors at a speed synchronous with the continuation conveyor, on the side of said arms which is opposite to the timber mat; guiding said supporting arms on their closed path to support the piece of timber which is first in said timber mat in its feed direction, from the underside of this piece; guiding said pressing members on their closed path to position themselves above the timber pieces resting on said supporting arms; releasing said pressing members to press down from above on the upper surface of the timber pieces resting on the supporting arms in such an area in the width direction of the timber piece that the point of action of the pressing members is located, counted from the front edge of the timber piece, within a distance equalling the width of the narrowest timber piece to be handled; and transporting the timber piece, clamped between said supporting arms and pressing members, onto the continuation conveyor to be transported further.

3,923,143

SHUFFLE FEEDER CAPABLE OF SINGLE FILE ADVANCEMENT OF ARTICLES

Chester Green, San Jose, Calif., assignor to Genevieve I. Hanscom and Genevieve I. Hanscom, Robert Magnuson & Lois J. Thomson, Trustees of Roy M. Magnuson Estate, all of San Jose, Calif., a part interest to each

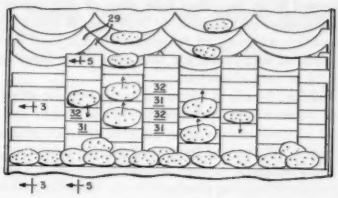
Filed June 10, 1974, Ser. No. 478,034
Int. Cl.² B65G *25/04*
U.S. Cl. 198—30 1 Claim

1. A shuffle feed mechanism for articles, said mechanism comprising:

a first set of elongated shuffle feed members having front faces and being positioned in spaced parallel relationship; a second set of elongated shuffle feed members having front faces and being positioned one between each adjacent pair of the first members to provide successive valleys formed by the front faces thereof;

means for supporting each of said sets for relative reciprocating motion in parallel relationship thereby to provide a valley-to-valley advancement for articles resting along the front faces of the feed members; and

wedge-shaped members fixed to the member front faces and with an elongated pointed edge extending parallel to the front faces to prevent the progression of articles aligned with the wedge-shaped members, said wedge-shaped



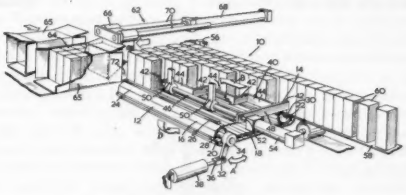
members being positioned in spaced rows whereby the articles will progress along spaced paths between the wedge-shaped members.

3,923,144

INTERMITTENT LOAD ACCUMULATOR

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Filed Mar. 18, 1974, Ser. No. 451,726
Int. Cl.² B65G *47/26*
U.S. Cl. 198—31 AB 1 Claim



1. In a carton loading machine having a loading station in which a plurality of load units arranged in a required side by side load configuration are loaded into a carton, an accumulator station in which the load units are arranged in the required load configuration and transferred to the loading station, the improvement of first conveyor means for feeding load units in a single file row;

a. a second conveyor mounted for movement of an upper face thereof at right angles to said first conveyor, said second conveyor having a back end, a front end and a pair of oppositely disposed side edges, transversely extending guide rails mounted on said second conveyor and extending transversely of said second conveyor to divide said second conveyor into a plurality of longitudinally spaced transversely extending load unit receiving slips which are open at each side edge of the conveyor, said slips being alignable with said first conveyor adjacent the back end of said second conveyor whereby a row of load units may be fed into each slip,

b. means for intermittently moving said second conveyor longitudinally of itself in the direction from said back and towards said front end to move each slip in turn into alignment with said first conveyor,

c. pusher bar means disposed above said second conveyor and mounted for movement transversely of said second conveyor, said pusher bar means having a plurality of segments extending in the longitudinal direction of said second conveyor means, each of said segments extending across a slip, each segment being spaced from its adjacent segment in the direction of the transverse extent of said second conveyor a distance equal to the width of the required load configuration,

d. means for moving said pusher bar means transversely of said second conveyor to and from a first retracted posi-

tion to receive a row of load units advanced by said longitudinal movement of said second conveyor and a second extended position in which an accumulated load is discharged from the other side edge of said conveyor, said longitudinal and transverse movements being effected in sequence whereby an assembled load is discharged transversely of said conveyor following each longitudinal advance of said conveyor,

e. a loading platform disposed in an edge-to-edge side-by-side relationship with respect to said other side edge of said second conveyor to receive the accumulated load which is discharged from said second conveyor, and

f. carton loading pusher means mounted to reciprocate above said loading platform in the direction of movement of said first conveyor means to move an accumulated load into a position filling a carton.

3,923,145

APPARATUS FOR PLACING COVER SHEETS ON STACKS OF DIFFERENT HEIGHTS

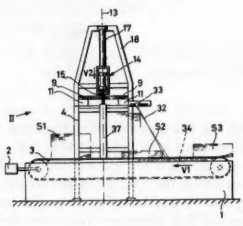
Hans Muller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Nov. 14, 1973, Ser. No. 415,804

Claims priority, application Switzerland, Nov. 17, 1972, 16831/72

Int. Cl.² B65G *57/00*

U.S. Cl. 198—35 **8 Claims**



1. In an apparatus for placing cover sheets on stacks of different heights, a combination comprising a conveyor having a substantially horizontal upper run on which stacks of significantly different heights are continuously advanceable at a constant rate of speed; a pusher member mounted above said upper run and movable at a constant rate of speed in a straight line between a rest position farther from, and an operated position closer to said upper run; drive means for moving said pusher member between said positions; feed means laterally of said straight line intermediate said positions for engaging a cover sheet at a margin thereof, and for feeding said cover sheet into the path of movement of said pusher member; retaining means for engaging and retaining a respective cover sheet on said pusher member as the same moves towards said operated position; and actuating means for actuating said drive means in response to the approach of a stack towards said pusher member, including sensing means which senses the upper trailing edge of the approaching stack, so that in response to said sensing of said upper trailing edge of the approaching stack said pusher member is actuated and pushes a retained cover sheet into contact with the respective stack when the latter is in precise alignment with said straight line.

3,923,146

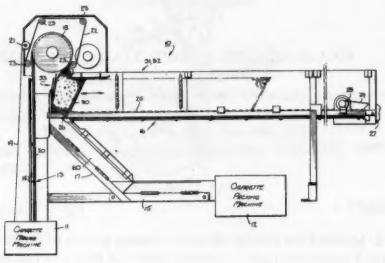
CIGARETTE TRANSFER ASSEMBLY FOR TRANSFERRING CIGARETTES FROM A CIGARETTE MAKING MACHINE TO A CIGARETTE PACKAGING MACHINE

Floyd Van Hall, Durham, N.C., assignor to Liggett & Myers Incorporated, Durham, N.C.

Filed July 25, 1974, Ser. No. 491,622

Int. Cl.² B65G *43/08*

U.S. Cl. 198—37 **1 Claim**



1. A cigarette transfer assembly comprising

a first vertical conveyor for conveying a stream of individually spaced apart cigarettes upwardly to an elevated position;

a second horizontal conveyor for receiving a flow of cigarettes from said first conveyor;

a reservoir means extending from between said elevated position of said first conveyor and said second conveyor for receiving excess cigarettes from said flow of cigarettes and for delivering the excess cigarettes into said flow at a subsequent time, said reservoir means including an elongated conveyor extending transversely from the flow of the cigarettes, said conveyor being expandable transversely of the flow of the cigarettes to said second conveyor for receiving excess cigarettes thereon and a sensing means on an opposite side of said flow of cigarettes from said elongated conveyor for sensing a change in the flow rate of cigarettes between said first and second conveyors, said sensing means including a pair of switches located in preset position and a pivotally mounted plate responsive to changes in the flow rate of cigarettes between said first and second conveyors, each said switch being operatively connected to said elongated conveyor to activate said elongated conveyor, said plate being positioned between said switches to selectively activate one of said switches in response to an accumulation of cigarettes between said first and second conveyors to activate said elongaed conveyor to receive excess cigarettes and the other of the said switches in response to a reduced accumulation of cigarettes between said first and second conveyors to activate said elongated conveyor to expel cigarettes.

3,923,147

SYNCHRONIZED STACKING SYSTEM

Richard M. Quinn, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

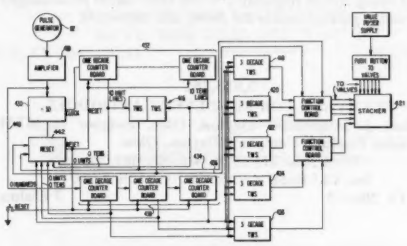
Division of Ser. No. 117,586, Feb. 22, 1971, Pat. No. 3,762,907. This application Feb. 15, 1973, Ser. No. 351,404

Int. Cl. B65g *43/00*

U.S. Cl. 198—40 **5 Claims**

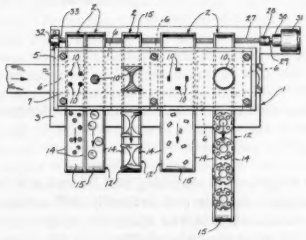
1, A synchronized stacking system for use with a glassware forming machine having a plurality of sections each of which repetitively performs a sequence of steps in the formation of rigid glassware articles, said synchronized stacking system comprising ware grouping means, means for providing electri-

cal pulses indicative of the stage of operation of said machine, and means for counting said electrical pulses in timed relation-



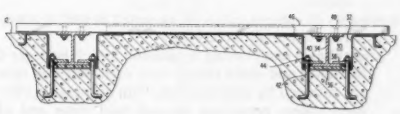
ship to said ware stacking means whereby a desire grouping of ware on an associated conveyor is effected.

3,923,148
CONVEYING SYSTEM
Wolfgang C. Dorner, Hartland, Wis., assignor to Dorner Tool & Die, Inc., Milwaukee, Wis.
Division of Ser. No. 258,698, June 1, 1972, abandoned. This application Feb. 26, 1974, Ser. No. 445,988
Int. Cl.² B65G *37/00*
U.S. Cl. 198—75 **7 Claims**



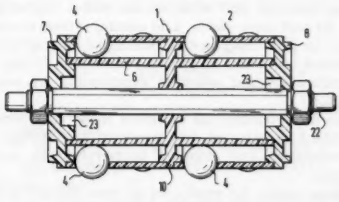
1. A conveyor system, comprising a series of endless belt conveyors disposed in side-by-side relation, each conveyor having a pair of spaced side walls and including a drive spindle and an idler spindle and an endless belt trained over the drive spindle and the idler spindle, the ends of the spindles disposed inwardly of the respective side walls, each drive spindle having a non-circular bore and the bores of the spindles being disposed in axial alignment, a drive shaft disposed within the aligned bores of the spindles and having a non-circular peripheral surface to complement the bores, each end of the drive spindle being provided with an axial recess, a bushing secured within an aperture in the side wall and received within the recess in the corresponding end of the spindle, whereby the ends of the spindle are journalled on the respective bushings each bushing having a central opening to receive the shaft with the diameter of the central opening being greater than the external dimension of the shaft so that the shaft is out of contact with the bushing, and drive means operatively connected to the shaft to drive the shaft and simultaneously operate the series of conveyors.

3,923,149
MATERIAL HANDLING APPARATUS FOR HOGGED FUEL
George H. Stearns, Kalispell, Mont., assignor to Mill Supply, Inc., Missoula, Mont.
Filed June 8, 1973, Ser. No. 368,362
Int. Cl.² B65G *25/04*
U.S. Cl. 198—106 **9 Claims**



2. A material handling apparatus for advancing material comprising a base including a conveyor surface having a plurality of laterally spaced longitudinally extending guideways recessed below said conveyor surface, a plurality of conveyor sections mounted on said surface, each said section including an elongated pushbar at least partially disposed within a recessed guideway and carried thereby for longitudinal reciprocating movement relative to said conveyor surface, a plurality of crossbars secured to said pushbar at longitudinally spaced positions therealong for movement therewith and above said conveyor surface, a plurality of longitudinally spaced checker bars fixed to said surface with each checker bar located between a longitudinally adjacent pair of crossbars, each of said checker crossbars having an upwardly and forwardly inclined rear surface and a forward surface for butting material to be conveyed, means for advancing said sections in a forward direction whereby the crossbars advance the material forwardly thereof along said surface and over the inclined surfaces of said checker bars and for retracting said sections whereby the crossbars move under the advanced material with such material being retained against substantial rearward movement by the forward surfaces of said checker bars, a fixed support carried by said base, fluid actuated means engaging between said fixed support and said conveyor section for reciprocating the same, a conveyor located along the discharge end of said conveyor sections at an elevation below said conveyor surface for receiving material therefrom and discharging such material to one side of said apparatus, said advancing and retracting means being located on the side of said conveyor remote from said crossbars and bridging over said conveyor.

3,923,150
DEVICE FOR CONVEYING OBJECTS
Werner Jager, Eriskirch, Germany, assignor to Firma Industrie Treuhand AG, Switzerland
Filed Apr. 8, 1974, Ser. No. 459,240
Claims priority, application Germany, Apr. 9, 1973, 2317742; June 18, 1973, 2331019
Int. Cl.² B65G *13/02*
U.S. Cl. 198—127 R **11 Claims**



1. In an article conveyor having a plurality of track sections

arranged to define a conveying track, each track section comprising:

rotary housing means mounted for rotation, said rotary housing means including:

wall means defining an inner bore, and

a plurality of circumferentially spaced recesses formed in said wall means;

each recess having an inner end opening into said bore and an outer end opening outwardly of said housing means;

a plurality of spheres rotatably mounted in said recesses for free rotation in all directions;

said spheres each having a diameter which is larger than the inner and outer recess ends such that said spheres are retained by said recesses, with an outer portion of each sphere projecting through said outer end of its respective recess to support articles being conveyed, and an inner portion of each sphere projecting through said inner end of its respective recess and into said bore for free rotary movement therein.

3,923,151
DRIVE CONTROL SYSTEM FOR AN ENDLESS CONVEYOR BELT

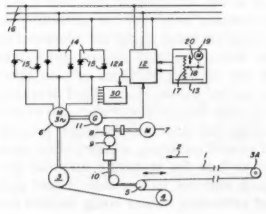
Karl-Heinz Weber, Witten-Heven, Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Oct. 23, 1973, Ser. No. 408,452

Claims priority, application Germany, Oct. 27, 1972, 2252709

Int. Cl.[2] B65G *23/00*

U.S. Cl. 198—203 **7 Claims**



1. The combination with an endless conveyor belt trained about a guide drum, said conveyor belt transporting a relatively heavy burden that changes from time-to-time whereby stresses are developed in the conveyor belt endangering it to probable tearing and similar destruction essentially only during periods of starting and stopping, a drive motor supplied with a multi-phase alternating current for rotating said guide drum to drive said conveyor belt, a tension drum contacting said conveyor belt, and position control means connected to said tension drum for developing a predetermined required tension upon said conveyor belt; of a control system to avoid tearing and similar destruction only during starting and stopping the conveyor belt while loaded with a relatively heavy burden by said drive motor, said control system comprising:

means for producing an electrical signal corresponding to a desired tensioning of said conveyor belt during starting acceleration and stopping deceleration by said drive motor,

means for producing an electrical signal to represent the actual tensioning of said conveyor belt during starting acceleration and stopping deceleration by said drive motor,

regulator means for producing an error signal corresponding to the difference between said electrical signals, said regulator means controlling said drive motor in response to said error signal during acceleration and deceleration to limit the developing conveyor belt tension not to exceed a value corresponding to said desired tension,

thyristors coupled in each phase of the multi-phase alternating current power supply lines for said drive motor, and a firing circuit responsive to the error signal produced by said regulator means for firing said thyristors.

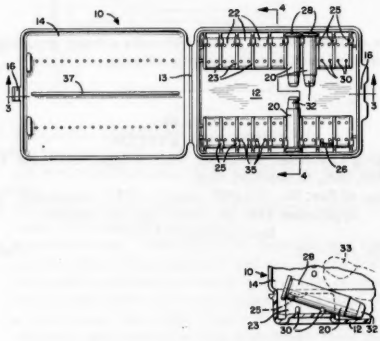
3,923,152
FLAT PACK FOR REVOLVER CARTRIDGES

William J. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio

Filed June 21, 1974, Ser. No. 481,786

Int. Cl.[2] B65D *43/16, 85/20;* **F42B** *37/00*

U.S. Cl. 206—3 **7 Claims**



1. A single piece flat pack for ammunition cartridges, comprising:

a. a base,

b. a lid,

c. integral hinge means attaching said lid and said base,

d. thin, laterally flexible and vertically stiff compartment divider walls each attached along one edge to said base and spaced apart somewhat farther than the diameters of the cartridges to form individual compartments for each cartridge,

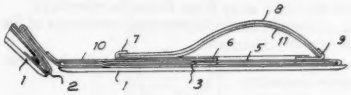
e. engaging and holding projections integral with said walls on the wall edges opposite said base and projecting from said walls over said compartments with spacings somewhat less than the cartridge diameters to overlie and releasably engage individual cartridges to hold the cartridges individually within said base, said flexible walls and projections yielding to accept and release cartridges being inserted into and pried from said compartments, and

f. at least one fulcrum on said base for prying individual cartridges loose from said engaging and holding projections whenever a predetermined portion of such a cartridge is pressed toward said base, said fulcrum including means for supporting a cartridge intermediate the ends thereof and cooperating with said projections to hold one end elevated above the other end for rotation about said fulcrum as said one end is pressed toward said base to pry the respective cartridge loose from said engaging and holding means, said engaging and holding projections being sized and spaced to release the cartridges upon being pressed toward said base.

3,923,153
DISPLAY DEVICE FOR DISPLAYING ARTICLES IN A BULGED CONDITION

Manuel Valls Rius, Avenida Balmes, 18, Igualada, Barcelona, Spain

Filed Dec. 20, 1974, Ser. No. 534,666
Int. Cl.² B65D *23/12, 1/22, 73/00*
U.S. Cl. 206—44.11 **10 Claims**



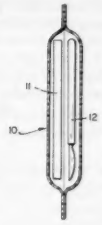
1. In a display device, lower support means and upper cover means connected to said lower support means for turning movement with respect thereto substantially about a predetermined axis between a covering position covering said lower support means and an uncovering position uncovering said lower support means, an upper sheet situated over and adjacent said lower support means to be located between the latter and said cover means when the latter is in its covering position, said upper sheet having inner and outer side edges extending substantially parallel to said axis with said inner side edge located closer to said axis than said outer side edge, said upper sheet having a pair of portions which are spaced from each other in the direction of said axis and which are fixed to said lower support means to define between said upper sheet and said lower support means a free space extending between said pair of portions of said upper sheet, a lower sheet situated in said free space and extending between said upper sheet and said lower support means, said lower sheet also having inner and outer side edges extending substantially parallel to said axis with said inner edge of said lower sheet being situated closer to said axis than said outer edge thereof, and said inner edge of said lower sheet being situated closer to said axis than said inner edge of said upper sheet while said outer edge of said lower sheet is situated more distant from said axis than said outer edge of said upper sheet, so that said lower sheet extends beyond said upper sheet at inner and outer side edge regions of said lower sheet, connecting means connecting said inner edge of said lower sheet to said cover means at a location spaced from said axis for responding to turning of said cover means from said covering to said uncovering position thereof to displace said lower sheet with respect to said upper sheet in a direction which moves said outer edge of said lower sheet toward said outer edge of said upper sheet, and a pair of attaching means for attaching to the inner edge of said upper sheet and the outer edge of said lower sheet a pair of opposed end regions, respectively, of an article which assumes a substantially flat condition when said cover means is in its covering position and which is capable of bulging upwardly away from said upper sheet when said outer side edge of said lower sheet approaches said outer side edge of said upper sheet in response to turning of said cover means from said covering to said uncovering position thereof, whereby the latter turning of said cover means will automatically bulge the article to be displayed outwardly in an attitude which is convenient for display purposes.

3,923,154
STERILANT PACKAGE

Jerry J. Tulis, Raleigh, N.C., and Robert A. Dobransky, Leominster, Mass., assignors to Litton Business Systems, Inc., Fitchburg, Mass.

Filed Apr. 5, 1973, Ser. No. 348,004
Int. Cl.² B65D *81/24*
U.S. Cl. 206—210 **8 Claims**

1. A package, said package having paper therein treated with a sterilizing amount of hexamethoxymethylmelamine, said paper containing from 0.1 to 20%, by weight, formaldehyde, provided by the hexamethoxymethylmelamine, whereby

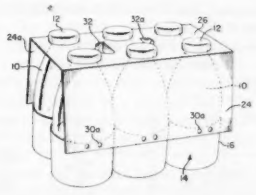


upon heating a sterilizing amount of formaldehyde is released in the package to effect sterilization.

3,923,155
BOTTLE CARRIER DEVICE

John J. Tanzer, 8501 West Higgins Road, Chicago, Ill. 60631

Division of Ser. No. 79,411, Oct. 9, 1970, Pat. No. 3,713,532.
This application Apr. 3, 1972, Ser. No. 240,566
Int. Cl.² B65D *65/10*
U.S. Cl. 206—427 **1 Claim**



1. A carrier package of two rows of bottles of the type having a thin-walled contents envelope and a cup-like protective base member on each of said envelopes separate and apart from each other, comprising sheet means including a horizontal shelf larger than the area of said two rows of bottles and two substantially rectangular attachment portions, said attachment portions connected along opposite edges of said horizontal shelf to depend therefrom over the opposite sides of said two rows of bottles and lap the side wall portions of each of the cup-like base members, said sheet means being formed of a resilient deformable plastic material and said horizontal shelf having apertures therein of a peripheral extent smaller than the peripheral extent of the necks of said bottles below the caps thereof, the apertures of said horizontal shelf being stretched and applied over said bottles with the material of said horizontal shelf circumferentially resiliently gripping the bottle necks, means directly connecting the lapped areas of said attachment portions to the side wall portions of each of said base members by separate releasable fastening means for each base member for permissive and selective removal of individual bottles from the package, and a handle grip portion formed in said horizontal shelf between the necks of said bottles.

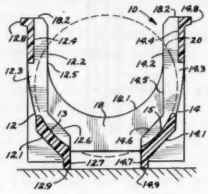
3,923,156
WATER BASKET

Victor C. Wallestad, Edina, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed Apr. 29, 1974, Ser. No. 465,337
Int. Cl.² B65D *57/00, 85/30;* **B05C** *11/14*
U.S. Cl. 206—454 **7 Claims**

1. A wafer basket having opposed side walls for carrying axially aligned wafers therebetween, an open top through which wafers may be inserted and ejected, and end walls

joining the side walls, the side walls having lower portions offset inwardly and defining wafer-support surfaces curved to the peripheral contour of the wafers to engage and support the wafers over a substantial portion of their peripheries, the side walls also having confronting ribs substantially throughout



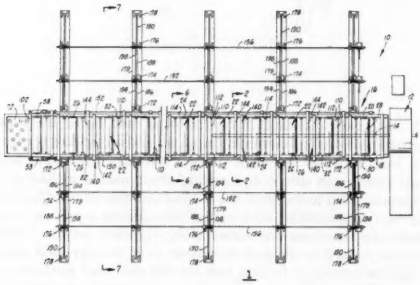
their heights separating the wafers from each other and extending inwardly on the offset portions of the walls to stabilize wafers in the basket, and the side walls having vertical slots to permit free circulation of processing liquids around the wafers and drainage of the liquids out of the basket.

3,923,157

BAR HANDLING AND LENGTH DETERMINING APPARATUS

Clarence W. Cavenar, Del City, Okla., assignor to W & Steel Co., Oklahoma City, Okla.

Filed July 17, 1974, Ser. No. 489,107
Int. Cl.² B07C 5/04
U.S. Cl. 209—73 **5 Claims**



1. A bar handling and length determining apparatus, comprising:

a frame having a guide track;

a conveyor assembly comprising:

an elongated first side member having a first support track edge, and a plurality of in-line apertures;

an elongated second side member having a second track support edge, the second side member disposed in spaced-apart parallel relationship to the first side member and having a plurality of in-line apertures, each aperture matingly aligned with one of the apertures of the first side member;

a plurality of rollers disposed between the first and second side members, each roller having an axle bearingly mounted in an aperture of the first side member and the mating aperture of the second side member;

rotating means rotating the rollers for moving bars along a path in the first direction; and,

a strike plate;

roller means disposed between the guide track of the frame and the support track edges of the first and second side members rollingly supporting the conveyor for movement in a first direction and in a second direction opposite to the first direction;

a plurality of strike members reciprocatingly positionable in striking engagement with the strike plate, the strike members disposed at predetermined spaced-apart distances for selective positioning in the path of the strike plate for terminating movement of the power conveyor assembly in the first direction;

select means positioning a selected strike member in the path of the strike plate;

power means selectively moving the conveyor assembly in the first direction toward the strike members, and in the second direction away from the strike members;

bar stop means selectively terminating movement of the bar in the first direction; and,

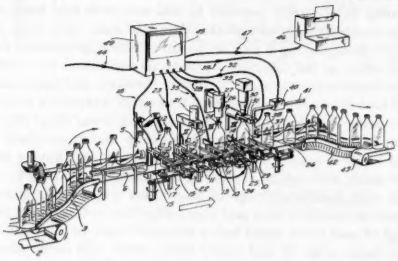
bar removal means selectively removing the bar from the conveyor assembly.

3,923,158

ON-LINE MULTISTATION INSPECTION DEVICE FOR MACHINE MOULDED PRODUCTS

Göran Fornåå, Kungalv, Sweden, assignor to Aktiebolaget Platmanufaktur, Malmo, Sweden

Filed June 5, 1974, Ser. No. 476,602
Claims priority, application Sweden, June 21, 1973, 7308766
Int. Cl.² B07C 5/342
U.S. Cl. 209—75 **6 Claims**



1. Apparatus for inspecting moulded containers from a plurality of moulds wherein each mould moulds in the container an identification unique to the mould comprising a first inspection station including means for reading the moulded identifications of the container and transmitting identification signals related to the read identifications, a second inspection station including means for detecting particular flaws in the moulded containers and for transmitting flaw indicating signals, means for guiding moulded containers serially through the inspection stations, and registering means receiving the flaw indicating signals and the identification signals for registering which of the moulds is producing faulty containers.

3,923,159

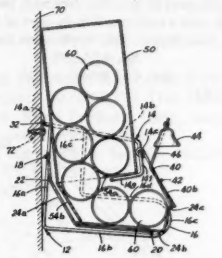
PRODUCT DISPLAY AND ARTICLE DISPENSING DEVICE

Robert Taylor, Evanston, and Charles Kleiman, Highland Park, both of Ill., assignors to Lake Chemical Company, Chicago, Ill.

Filed Sept. 16, 1974, Ser. No. 506,345
Int. Cl.² A47F 7/28
U.S. Cl. 211—49 D **2 Claims**

1. A portable, self-supporting product display and article dispensing device suitable for positioning on a counter or the like, comprising a one-piece, unitary, wire framework having an article receiving portion and a carton supporting portion, said article receiving portion having side members for supporting article holding means therebetween, said side members having a forwardly extending base section which serves as a support for the device when it is placed on a counter, or the like, and an upwardly extending rear section to which the

carton supporting portion of the framework is secured, said carton supporting portion having upper and lower carton engaging means for supporting an article containing carton in a substantially upright position on the framework, said lower carton engaging means including a freely supported extension positioned in transverse relation with respect to the side members of the carton supporting portion, said extension providing an elevated, rearwardly extending, downwardly inclined surface on which a partly opened end of an article containing carton rests and which serves as the main supporting surface for said carton, said surface acting to maintain said end of the carton in vertically spaced relation with respect to the article holding means supported between the side members of the article receiving portion of the framework whereby articles in the carton can pass downwardly through an opening in said end of the carton into the article receiving portion of the device.



3,923,160

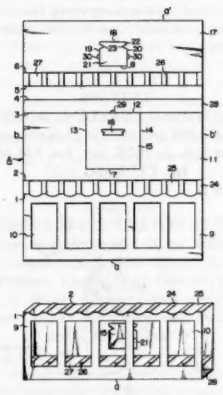
TEST TUBE SUPPORT

Tadayo Hirano, Tokyo, and Koichi Sato, Hatano, both of Japan, assignors to Jintan Terumo Co., Ltd. and Toppan Printing Co., Ltd., both of Tokyo, Japan

Filed Aug. 29, 1974, Ser. No. 501,433

Int. Cl.[2] A47G *29/00*

U.S. Cl. 211—73 **2 Claims**



1. A foldable test tube support formed from rectangular sheet material, said test tube support having a compartmentalized top, a bottom, a front wall, a doubled rear wall and a compartmentalized intermediate wall interposed between the top and the bottom, said sheet material having in series:

a large front wall section adapted to form said front wall and having a plurality of windows:

a narrow top section adapted to form said top and having a plurality of openings, the top section being separated from the front wall section by a first fold line;

an outer rear wall section having the same size as the front wall section, the outer rear wall section being separated from the top section by a second fold line;

a bottom section adapted to form said bottom and having the same size as the top section, the bottom section being separated from the outer rear wall section by a third fold line;

a first wall section adapted to be bonded to said front wall section to secure the same, said first wall section being so narrow that said intermediate wall is located near but spaced from said bottom when the test tube support is formed, said first wall section being separated from the bottom section by a fourth fold line;

an intermediate wall section adapted to form said intermediate wall, and having a plurality of openings corresponding in number and location to the openings of said top and the same size as the top section, the intermediate wall section being separated from the first wall section by a fifth fold line; and

an inner rear wall section adapted to be bonded to said outer rear wall section, forming therewith said doubled rear wall when the test tube support is formed, the total size of the inner rear wall section and the first narrow wall section having substantially the same size as the front wall section, the inner rear wall section being separated from the intermediate wall section by a sixth fold line;

said outer rear wall section has substantially at a center area thereof a rectangular first support wall section having a slit therein defined by a seventh fold line parallel to and adjacent to said second fold line, a first cut line provided in said third fold line and opposed second and third cut lines, and

said inner rear wall section has substantially at a center area thereof a rectangular second support wall section defined by eighth fold line parallel to and adjacent to said sixth fold line, a fourth cut line opposite said eighth fold line and opposed fifth and sixth cut lines, said second support wall section being adapted to be lockingly fitted into said slit in said first support wall section to support the test tube support when it is constructed.

3,923,161

SYSTEM OF STRUCTURAL COMPONENTS FOR THE CONSTRUCTION OF SHELFLIKE STRUCTURES IN FRAME RACKS

Rudolf Kaiser, Karlsruhe; Werner Karcher, Kuppenheim, and Wolfgang Bringe, Wettersbach, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 1, 1974, Ser. No. 493,905

Claims priority, application Germany, Aug. 24, 1973, 2342866

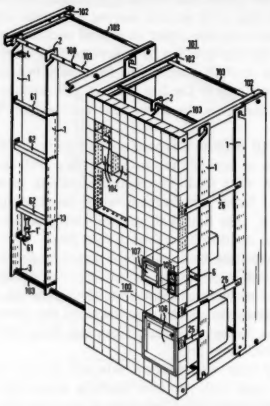
Int. Cl.[2] A47F *5/10*

U.S. Cl. 211—117 **10 Claims**

1. A system of structural components for the construction of shelf-like structures in a frame rack which includes a rod disposed parallel to the upper edge of the frame rack and a rod running parallel to the lower edge of the frame rack, including structural components which can be arranged vertically and horizontally in the frame rack and can be assembled without the aid of tools, the essential structural components comprising:

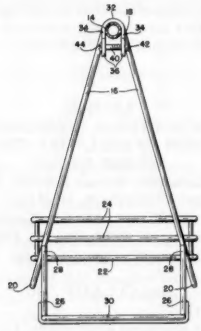
a. verticai suspension rails provided with rows of keyhole shaped openings parallel to their short side and including suspension rails of a first type having an upper end designed in a hook shape for hooking on to the rod disposed parallel to the upper edge of the frame rack and having a recess in the lower edge for guidance along a rod running parallel to the lower edge of the frame rack; and

b. horizontal supporting rails of a U-profile with the lateral edges of their legs bent inward essentially parallel to their base and including upwardly extending angular extensions at their ends having at least two cutouts in the



portion perpendicular to their load carrying surface; and c. button like-connecting elements mounted captively in the keyhole shaped openings in the suspension rails into which the cutouts of the angular extension of the supporting rails can be hung.

3,923,162
SHOWER CADDY
John J. Hussey, c/o Frohock-Stewart, Inc., 79 Beacon St., Worcester, Mass. 01608
Filed Feb. 11, 1974, Ser. No. 441,363
Int. Cl.² A47F *5/08*; A47H *1/16*
U.S. Cl. 211—119 **1 Claim**

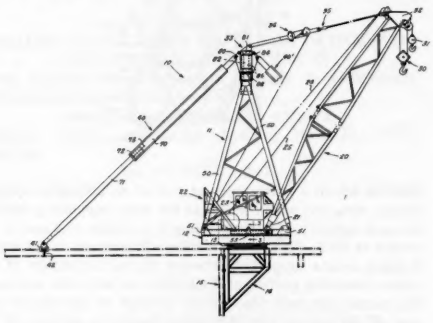


1. A shower caddy comprising a loop adapted to be hung on the shower arm for a nozzle in a shower stall, said loop including portions extending in a downward direction forming an inverted C, article holders at the lower end of the V-shaped loop, and means attached to the loop at the upper end of the caddy for securing the same to said shower arm,

said means comprising a pair of free-ended arms adapted to embrace the shower arm, and including a fastener engaging both arms to move said arms to spring them toward each other to grip the shower arm,

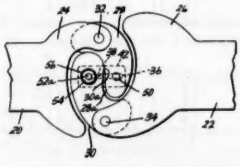
said arms forming part of a downwardly opening U-shaped member, the closed portion of the U-shaped member being in conformance with the loop at the apex of the V, the U-shaped member being secured in conformance with the loop and welded thereto in the curved portion only thereof, the arms of the U-shaped member being free of the loop for movement to grip the shower arm.

3,923,163
CRANE
Jack J. Brewer, Grapevine, Tex., assignor to Sam P. Wallace Company, Inc., Dallas TX
Continuation-in-part of Ser. No. 209,583, Dec. 20, 1971, Pat. No. 3,777,900, and a continuation-in-part of Ser. No. 356,995, May 3, 1973, abandoned. This application Dec. 10, 1973, Ser. No. 423,399
Int. Cl.² B66C *23/06*
U.S. Cl. 212—54 **21 Claims**



1. A crane comprising: a base platform; rotatable support means for said platform; a mast mounted on said platform having a vertical axis coincident with the axis of rotation of said platform on said rotatable support means; a boom having a boom foot; pivot means for pivotally securing said boom foot to said platform in load bearing operating relationship at a selected one of a plurality of locations along said platform; bracing means for the upper end portion of said mast securable between said mast and support structure independent of said base platform and spaced horizontally from said base platform; horizontally reciporable means for securing said pivot means on said platform for movement of said boom foot to any one of several locations ranging from alignment with said axis of rotation of said mast to outwardly of one end of said base platform.

3,923,164
DRAWHEAD LEVELING DEVICE
Everett L. Dalton, 2205 Jefferson St., Logansport, Ind. 46947
Filed Feb. 3, 1975, Ser. No. 546,682
Int. Cl.² B61G *3/00*
U.S. Cl. 213—75 R **9 Claims**



5. Apparatus for maintaining horizontal alignment between complementary drawheads for coupling rail cars comprising

a U-shaped leveler member having a substantially horizontal foot and two elongated parallel upstanding posts orthogonally extending from said horizontal foot, said up-

standing posts being insertable in openings formed in the complementary drawheads,

said upstanding posts being restricted from vertical movement relative said foot and at least one of said posts being horizontally movable relative said foot, whereby on relative movement of the drawheads, said posts are horizontally movable relative one another, and

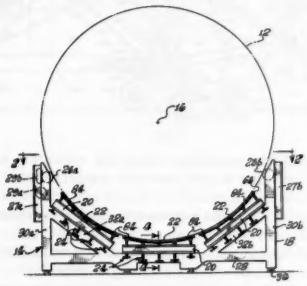
means to vertically adjust and retain at least one of said posts relative the drawheads whereby the drawheads will be vertically adjustable and supportable relative to one another.

3,923,165

DEVICE FOR TRANSLATING AND ROTATING A ROCKET MOTOR OR THE LIKE

Robert E. Burdick, Santa Barbara, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.

Filed Oct. 1, 1973, Ser. No. 402,316
Int. Cl. B60v *1/00*
U.S. Cl. 214—1 BE **5 Claims**



1. A device for supporting a cylindrical load for simultaneous translation and rotation, comprising:

a frame for resting a horizontally extending surface and including means defining load-supporting surfaces positioned in a generally arcuate configuration relative to a horizontally extending axis located above said frame;

a plurality of air bearings carried on said frame at said surfaces, each of said air bearings having a resilient and compliant diaphragm with a restrained center portion and an annular portion inflatably responsive to pressurized air passing through openings therein, and having a curvature generally conforming to the curvature of a cylindrical load for receiving and uplifting thereagainst; and

adjustment means attached to said frame and said air bearings for changing the spacing therebetween.

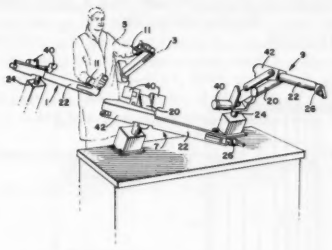
3,923,166

REMOTE MANIPULATOR SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Donald A. Kugath, Frazer, Pa.; Dan H. Dane, Huntsville, and Herman T. Blaise, Gunterville, both of Ala.

Filed Oct. 11, 1973, Ser. No. 405,341
Int. Cl.² B25J *3/04*
U.S. Cl. 214—1 CM **7 Claims**

1. A remote manipulator system comprising a master unit and a slave unit controlled by signals from said master unit, said master unit and said slave unit each separately comprising an elongated support arm mounted on a floor for rotation about its longitudinal axis, said support arm being mounted on said floor at about a 30° angle from an imaginary line perpendicular to said floor; an elongated upper arm; means mounting one end of the upper arm on the end of the support arm remote from the floor for pivotal movement of the upper arm about an axis perpendicular to the longitudinal axis of the support arm and for rotational movement of the support arm about its longitudinal axis; a lower arm having one end connected to the other end of the upper arm for pivoting the lower arm about an axis parallel to the axis about which the upper arm pivots on the support arm; servomechanism means for causing the individual arms of said slave unit to occupy the same relative position as the corresponding arms of said master unit; a gripper unit having an operable holder thereon



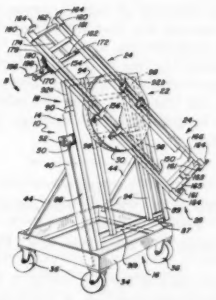
adapted to grasp and release items; means mounting said gripper unit on the other end of the lower arm of said slave unit for pivotal movement and rotational movement about two mutually perpendicular axes; manually manipulatable control element means positioned at the other end of said lower arm of the master unit; and communication means communicating the status of said manually manipulatable control element means to said gripper unit for controlling the pivotal movement of the gripper unit and operation of said holder.

3,923,167

DOOR HANGING DEVICE

Ranzel Blankenbeckler, 217 E. Henry St., Pontiac, Ill. 61764

Filed May 9, 1974, Ser. No. 468,518
Int. Cl.² B25B *1/22*
U.S. Cl. 214—1 D **8 Claims**



1. A sheet holding device comprising:

a base;

a substantially vertical frame pivotally mounted on the base, said frame being movable between a generally vertical position and a generally horizontal position;

a movable second vertical frame slidably mounted on said first vertical frame for generally vertical reciprocal movement with respect thereto;

carriage means mounted on said second movable frame for generally vertical reciprocal movement with respect thereto;

rotatable means mounted on said carriage means for rotational movement with respect to said carriage means; and

grasping means mounted on said rotatable means, said

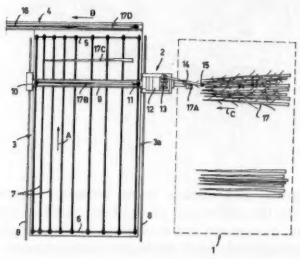
grasping means being capable of retaining a sheet therein when the sheet is in any relative position.

3,923,168

EQUIPMENT FOR TRANSFERRING HEAPED TREE TRUNKS ONTO A TRANSPORTER FOR FURTHER PROCESSING

Antti Tapani Valo, 08100 Lohja 10, Finland

Filed Sept. 3, 1974, Ser. No. 502,587
Claims priority, application Finland, Sept. 3, 1973, 2740/73
Int. Cl.² B25J *3/00*
U.S. Cl. 214—1 BB **3 Claims**



1. Equipment for transferring tree trunks one-by-one from a first region to a second region, the equipment comprising a feeding device for removing the tree trunks from the first region, a receiving table, and conveyor means on the receiving table for receiving tree trunks which have been removed from the first region by the feeding device and conveying them to the second region, the feeding device being movable with respect to the receiving table substantially parallel to the feeding direction of the conveyor means and comprising:
- a gripper for gripping a tree trunk disposed in said first region;
- a roller conveyor having its feeding direction transverse to the feeding direction of said conveyor means and positioned to receive the tree trunk from the gripper and advance it longtudinally; and
- a second conveyor having its feeding direction aligned with the feeding direction of the roller conveyor and arranged to receive the tree trunk from the roller conveyor and advance it longitudinally to discharge it onto said conveyor means.

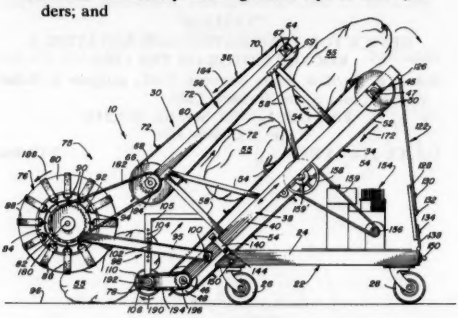
3,923,169

APPARATUS FOR COLLECTING SOLID-WASTE MATERIAL

Gerhardt Van Drie, 724 West Pine Ave., El Segundo, Calif. 90245

Continuation-in-part of Ser. No. 359,074, May 10, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,630
Int. Cl.² B65G *15/14*
U.S. Cl. 214—42 R **13 Claims**

1. A solid-waste-material-handling-and-collecting apparatus, wherein said solid waste-material is encapsulated within a plastic bag and said apparatus is adapted to be used in combination with a collection vehicle, said apparatus comprising:
- an undercarriage;
- means secured to said undercarriage for movably supporting said carriage;
- a conveyor system adjustably mounted to said undercarriage wherein the forward end of said conveyor system is inclined downwardly in close proximity to the road surfae thereon, forming a material-receiving end;
- a loading pick-up means adjustably mounted to said conveyor system and disposed adjacent said material-receiving end of said conveyor system; wherein said loading pick-up means comprises:
- a first pick-up roller adjustably mounted to said conveyor system and positioned forward therof for flexible engagement with said encapsulated waste material, wherein said first pick-up roller comprises:
- a pair of cylinders, spaced apart;
- a drive axle having said cylinders removably mounted adjacent each end thereof for rotation therewith;
- a plurality of flexible straps disposed between said cylinders, thereby forming a flexible roller;
- means for removably securing said straps to said cylinders; and



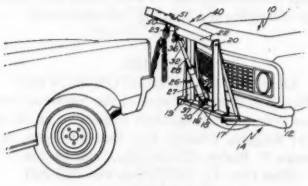
- an adjustable mounting means for mounting said first pick-up roller to said conveyor system forward thereof; and
- a second pick-up roller mounted to the lower receiving end of said conveyor system and adjustable therewith, to provide the proper space between said second roller and the road surface when traversing thereover;
- a power drive operably connected to said conveyor system and said loading pick-up means; and
- means for removably attaching said apparatus to said collection vehicle, whereby said apparatus is towed by said vehicle.

3,923,170

LIFTING BOOM FOR TRUCK

Florian E. Marquis, 45 Olo St., Woonsocket, R.I. 02895

Filed Sept. 23, 1974, Ser. No. 508,174
Int. Cl.² B60P *3/12*
U.S. Cl. 214—86 A **3 Claims**



1. In a mechanism for raising loads, a vehicle, a frame extending from one end of the vehicle and having an arm-like member, means pivoting said member to said frame, a hydraulic ram connected between the frame and said member, a boom supported along the top of said member and extending therefrom, said boom having an upwardly opening hook secured to one end for engaging the pivoting means and longitudinally spaced downwardly projecting locating means for engaging the free end of said member, said boom having a lift

means adjustably positioned therealong and carrying means for affixing a cable thereto.

3,923,171

TENSION LINES

John James Muir Pragnell, Farnham, and Robert Leonard Langley, Baldock, both of England, assignors to Irvin Industries Inc., Greenwich, Conn.

Filed Nov. 7, 1974, Ser. No. 521,916

Claims priority, application United Kingdom, Nov. 8, 1973, 51946/73

Int. Cl.² B66D *3/00*

U.S. Cl. 254—135 R 9 Claims

1. In a tension line system including a load supporting tension line having a high modulus of elasticity with substantial recoil rebound on dynamic unloading of a load within the elastic limit thereof, the combination with said tension line of an elongate flexible member for damping recoil rebound of said tension line on dynamic unloading thereof, said flexible member being co-extensive in close parallel relationship over at least a substantial length of said tension line, said tension line and said flexible member being capable of relative longitudinal displacement whereby said flexible member is substantially non-load bearing with respect to the load supported by said tension line, and the mass and material of said flexible member being predetermined in relation to the ratio of expected normal loading of said tension line to the load limit breaking point thereof.

3,923,172

DEVICE FOR RIGIDLY ASSEMBLYING TWO ELEMENTS OF A JIB OF A PUBLIC WORKS MACHINE

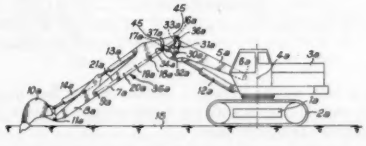
Christian S. Jankowiak, Meaux, France, assignor to Societe Anonyme: Poclain, Le Plessis Belleville, France

Filed Nov. 11, 1974, Ser. No. 522,909

Claims priority, application France, Nov. 22, 1973, 73.41664

Int. Cl.² E02F *3/38*

U.S. Cl. 214—141 5 Claims



1. A device for rigidly assembling the two elements of a jib of a public works machine, in which the two elements are connected by two means of articulating them to each other, this device comprising at least one first connecting rod (or a set of parallel connecting rods), articulated on each of the elements of the jib, said device further comprising a second connecting rod (or a second set of parallel rods), also articulated on each of the elements of the jib, the first and second connecting rods (or set or rods) being articulated on one of the elements of the jib about the same axis.

3,923,173

APPARATUS FOR TRANSPORTING RECEPTACLES

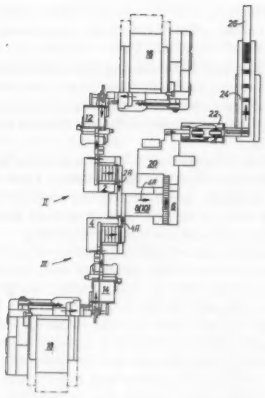
Bernard Schubert, Neu Bornsen, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Division of Ser. No. 292,630, Sept. 27, 1972, Pat. No. 3,820,671, said Ser. No. 292,630, is a continuation of Ser. No. 30,204, April 20, 1970, abandoned, which is a continuation of Ser. No. 631,504, April 17, 1967, abandoned, which is a continuation-in-part of Ser. No. 559,538, June 22, 1966, Pat. No. 3,444,981. This application Sept. 6, 1973, Ser. No. 394,724

Claims priority, application Germany, June 23, 1965, 56380

Int. Cl.² B65G *65/04*

U.S. Cl. 214—301 7 Claims



1. Apparatus for transporting rod-shaped smokers' products in receptacles having superimposed compartments for groups of products, comprising means for supplying a stream of individual rod-shaped products which form a row to a first station along a predetermined path wherein the products move sideways tranversely to the longitudinal axis of said products; collector means operative to convert the leading end of said stream at said first station into groups of parallel products; means for transferring said groups into successive compartments of a series of receptacles to thus convert such receptacles into filled receptacles; means for conveying receptacles substantially vertically at and away from said station, thereupon substantially horizontally in the longitudingal direction of products in the filled receptacles, and thereupon substantially vertically to a second station; means for removing said groups from filled receptacles at said second station, including means for moving the products of said groups lengthwise; and means for advancing the thus removed groups from said second station in the form of a stream of articles or groups of articles along a predetermined path wherein the products move sideways transversely to the parallel longitudinal axes of the products which make up said groups.

3,923,174

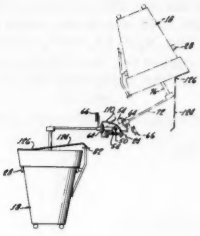
NON-STOP REFUSE COLLECTION CONTAINER

Marcel G. Stragier, 8201 Monterey Way, Scottsdale, Ariz. 85251

Division of Ser. No. 364,708, May 29, 1973, Pat. No. 3,878,953, which is a continuation of Ser. No. 199,813, Nov. 17, 1971, abandoned, which is a division of Ser. No. 15,421, March 2, 1970, abandoned. This application July 22, 1974, Ser. No. 490,515

Int. Cl.² B65F 3/02

U.S. Cl. 214—313 4 Claims



1. In combination, a refuse container and a refuse collection vehicle said refuse collection vehicle comprising:

an arm;

means on said arm for engaging said container;

means for moving said arm toward said container to engage said container when at a standing upright position on a roadway, without manual lifting or manual moving of said container;

means for moving said arm from a lowered position to a raised position for lifting the container from said standing upright position, and inverting the container to dump its contents into the vehicle without manual handling of said container; and said container comprising:

a lower body section of tapered configuration extending for the major portion of the height of the container for storing refuse, and when in said standing upright position in a roadway having its upper, larger end at a height above the height of said arm on said refuse collection vehicle when said vehicle is positioned adjacent said container on the roadway and said arm is in its lowered position;

an upper body section above said lower body section, and having a substantial height, the cross-section of said upper body section being at its lower end substantially larger than the cross-section of the upper end of the lower body section;

a generally horizontal shoulder integrally connecting the upper end of the lower body section to the lower end of the upper body section said shoulder strengthening said container to withstand the forces of engagement with the arm; and

a lid hinged to said upper body section and adapted to automatically open by the force of gravity when said container is inverted.

3,923,175

HITCH FOR PORTABLE CONVEYOR

Henry W. Landvatter, 3000 Barrett Station Road, Kirkwood, Mo. 63122

Filed July 22, 1974, Ser. No. 490,683

Int. Cl.² B60P 1/36

U.S. Cl. 214—509 7 Claims

1. In a dump truck and portable conveyor combination:

a. a portable conveyor including a hitch attachment means defining a longitudinal pivot axis,

b. a dump truck including a hitch attachment means defining a generally vertical pivot axis,

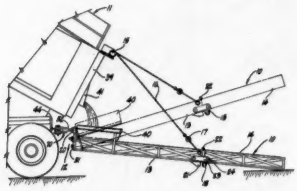
c. support means supporting the conveyor,

d. hitch means including:

1. first and second hingedly connected hinge plate means,

2. pivot means connecting said first hinge plate means to the conveyor hitch attachment means for rotational movement of the conveyor about said longitudinal pivot axis thereof,

3. link means extending between said second hinge plate means and the truck hitch attachment means, said link means including substantially parallel first and second spaced pivot axes,



4. first pivot means connecting said link means to said second hinge plate means for rotational movement of said second hinge plate means and said conveyor relative to the link means about the first pivot axis,

5. second pivot means connecting said link means to said dump truck hitch attachment means for rotational movement of said link means relative to said truck hitch attachment means about said second pivot axis, and

6. the second pivot means permitting lateral shifting of the first pivot means tending to compensate for lateral movement of points on the conveyor spaced from said first pivot means when the conveyor rotates about said first pivot axis.

3,923,176

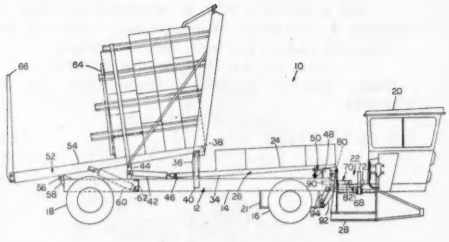
FIRST TABLE FOR A BALE WAGON

Edward J. Wynn, Fresno, and Lee D. Butler, Kingsburg, both of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 19, 1974, Ser. No. 498,782

Int. Cl.² B60P 1/44; A01D 87/12

U.S. Cl. 214—518 14 Claims



1. In a bale wagon having a mobile chassis and means mounted on said chassis defining a bale-supporting area, the improvement which comprises:

means mounted on said chassis for receiving at least one bale on a first one of its sides adjacently along and generally below said bale-supporting area, said bale-receiving means being selectively operable in either one of two modes for moving said bale upwardly to respectively deposit said bale on said first one of its sides, or a second

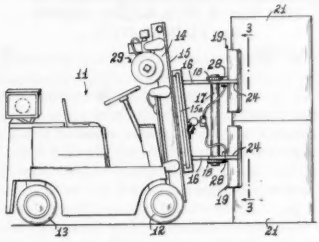
one of its sides adjacent to said first one side, on said bale-supporting area, said bale-receiving means being operable in a first one of said two modes to lift said bale upwardly through an arcuate path and deposit said bale on its second one side on said bale-supporting area, said bale-receiving means being operable in a second one of said two modes to initially lift said bale upwardly at its longitudinal portion located near said bale-supporting area and thereby dispose said bale in a tilted position with its first one side directed upwardly toward said bale-supporting area and then to push said tilted bale upwardly toward said bale- supporting area and deposit said bale on its first one side on said bale-supporting area.

3,923,177

VACUUM LIFT APPARATUS WITH A CONTROL VALVE ASSEMBLY

Earl A. Horton, Philadelphia, Pa., assignor to Little Giant Products, Inc., Peoria, Ill.

Filed June 21, 1973, Ser. No. 372,393
Int. Cl. B65g 47/00; B66f 9/18
U.S. Cl. 214—650 SG **3 Claims**



1. A vacuum controlled load lifting system comprising a mast assembly including a carriage mounted on a lift truck for vertical lifting movement, a plate mounted on the carriage, a resilient vacuum pad having a load contacting surface mounted on the front face of said plate, a valve body mounted on the back face of said plate, an axial bore in said body, a closure for one end of said bore, conduit means connecting said bore with a source of negative air pressure, a passageway in said body spaced from and parallel to said bore opening at one end onto the vacuum pad load contacting surface and having its other end communicating with the bore, a valve stem in said bore, and spring means between said closure and valve stem normally holding the valve stem in position to cut off the supply of negative air pressure to the passageway and with its forward end projecting through and beyond the plane of the load contacting surface, said valve stem being depressed upon contact with a load to connect the passageway with the conduit means.

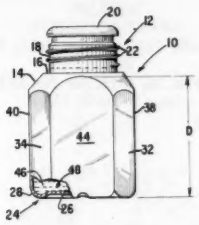
3,923,178

CONTAINER

George W. Welker, III, Downington, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed July 25, 1974, Ser. No. 491,905
Int. Cl.[2] A61J 9/00
U.S. Cl. 215—1 C **2 Claims**

1. A sealed plastic container for liquids at least a portion of which is capable of migrating through the plastic comprising:
1. A relatively rigid top;
2. A relatively rigid bottom;
3. At least four relatively narrow, substantially planar wall portions connecting said top and bottom;
4. At least four relatively wide, substantially planar wall portions connecting said top and bottom and connected one between each pair of relatively narrow wall portions, A. the width of said wide wall portions being about two to two and one half times the width of said narrow wall portions;
5. A liquid disposed within the container;
6. Said top, bottom and walls being formed from a plastic which is permeable by said liquid;



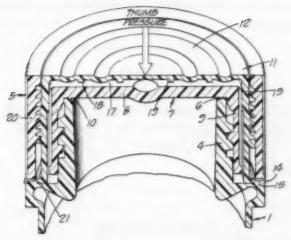
whereby the relatively wide wall portions become concaved when the liquid migrates through the plastic and the internal pressure becomes less than the ambient pressure while the relatively narrow wall portions, top and bottom, retain their initial shape.

3,923,179

MEDICAL LIQUID CONTAINER WITH TACTILE STERILITY INDICATOR AND METHOD OF TESTING CONTAINER

Pradip V. Choksi, North Hollywood, and Roy B. Steidley, Seal Beach, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 7, 1973, Ser. No. 338,661
Int. Cl. B65d 55/02
U.S. Cl. 215—203 **8 Claims**



1. A container with inner and outer closure for storing and dispensing sterile liquids, which includes a blow molded thermoplastic container with a dispensing outlet, and the container and outer closure forming a unit that has a transverse abutment means surrounding the outlet wherein the improvement comprises:

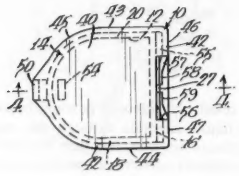
the inner closure secured to the container to close off the outlet and form a hermetically sealed enclosure, said inner closure having at least a portion that is openable for dispensing; and a separately formed thermoplastic outer cap with a longitudinal axis, which outer cap is hermetically sealed to the enclosure with a bacteria-tight bound proximate said abutment means, said outer cap having a manually deflectable top wall physically spaced a predetermined distance from the inner closure so that said wall can be deflected a sufficient amount by thumb pressure to cause the outer cap and inner closure to contact each other for a tactile determination of the integrity of the outer cap and inner closure; and said outer cap has both a thin frangible section proximate said abutment means and externally exposed threads with the threads of the

outer cap being in a axial alignment with the abutment means, whereby said threads can receive a threaded opening member and guide it toward the abutment means for exerting a pressure against the abutment means to axially pry the outer cap apart at its frangible section.

3,923,180
SAFETY CLOSURE

Mack Robert Fields, 1624-2 Lake Drive, Clearwater, Fla. 33516

Filed Feb. 26, 1975, Ser. No. 553,136
Int. Cl.² B65D *55/02*
U.S. Cl. 215—216 **19 Claims**

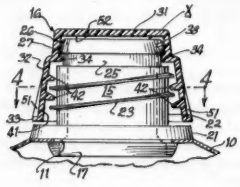


1. A safety closure for a container having an open top, said closure having a body portion and a depending skirt portion around three sides thereof which sides overlap the edge of said container surrounding said top portion, a pawl-like projection on said skirt portion projecting parallel to said body portion, a mating pawl-like element on said container projected outwardly therefrom and into alignment with said pawl-like projection on said closure, connecting means on the fourth side of said closure and on said container for connecting said closure to said container at least in the closed position of said closure, and resilient means on said closure acting on said connecting means for urging said pawl-like projection on said closure into latching engagement with said pawl-like element on said container.

3,923,181
CHILD-RESISTANT CLOSURES

Sidney M. Libit, 441 Lakeside Terrace, Glencoe, Ill. 60022

Filed Mar. 21, 1974, Ser. No. 453,481
Int. Cl.² B65D *55/02, 55/12*
U.S. Cl. 215—224 **16 Claims**

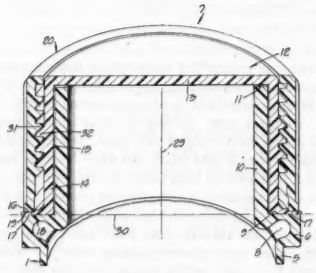


1. A closure for attachment to means defining the pouring opening of a container for a fluent substance, said closure comprising a hollow cylindrical neck extending from the periphery of said opening and a cylindrical cap adapted to be engaged with, and disengaged from, said neck to effect open and closed conditions of the container opening, at least the cap being of resilient but generally shape retaining material, said cap having a top wall and a skirt depending from the periphery of said wall, the neck and skirt having respective confronting faces, one of said faces having a helicoid outstanding therefrom and the other of said faces having a cam element outstanding therefrom, adapted to be driven by the helicoid, said helicoid and cam element being in overlapping relation in the closed condition of the closure, said cap and neck having respective bead and groove means which are engaged with a snap fit when the closure is in closed condition to restrain axial movement of the cap in response to force applied axially outwardly of the cap and said bead and groove means are disengaged upon forcible relative axial shifting of the cap and neck, to free the cap for removal, the overlap being such in relation to the tightness of said snap fit that simple rotation of the cap will displace the cam element away from overlapping relation with the helicoid by reason of the elasticity of the material and, upon application of digital, radial, squeezing force to the exterior of the skirt in the region of engagement of the element and helicoid, the displacing force is nullified and the element and helicoid are maintained in driving engagement to translate rotation of the cap into axial displacement of the cap against the bias of the snap fit.

3,923,182
FRANGIBLE CLOSURE SYSTEM FOR MEDICAL LIQUID CONTAINER

Pradip V. Choksi, North Hollywood, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 7, 1973, Ser. No. 338,685
Int. Cl. B65d *41/32*
U.S. Cl. 215—250 **16 Claims**



1. A container and closure system for storing and dispensing sterile liquids which includes a blow molded thermoplastic container with a dispensing outlet, a cap and a jacking ring, said container and cap forming a unit that has a transverse abutment means surrounding the outlet wherein the improvement comprises:

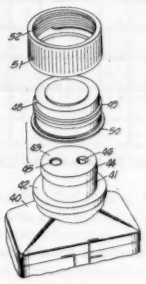
said cap being a separately formed injection molded thermoplastic cap with a longitudinal axis, said cap having both a thin frangible section and externally exposed threads said cap being sealed to the container proximate the abutment means with an annular bacteria-tight bond to form a hermetically sealed unit with said threads of the cap being in axial alignment with the abutment means, an internally threaded packing ring threadedly disposed on said cap and having a bottom surface engageable with said abutment means whereby said cap threads receive the threaded jacking ring and guide it toward the abutment means for exerting a pressure against the abutment means to axially pry the cap apart at its frangible section.

3,923,183

CONTAINER FOR MEDICAL LIQUID WITH SEPARABLE OUTER AND INNER CLOSURES

Pradip V. Choksi, North Hollywood, and Roy B. Steidley, Seal Beach, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 7, 1973, Ser. No. 338,662
Int. Cl. B65d *41/62, 51/18*
U.S. Cl. 215—251 **10 Claims**



1. A container and double closure system for storing and dispensing sterile liquids, which includes a blow molded thermoplastic container with a dispensing outlet, an inner closure, an outer cap, and a jacking ring, the container and outer cap forming a unit having a transverse abutment means surrounding the outlet wherein the improvement comprises:

an said inner closure being secured to the container to close off the outlet and form a hermetically sealed unit but is openable for dispensing; said outer cap being a separately formed injection molded thermoplastic outer cap with a longitudinal axis, said outer cap having both a thin frangible section and externally exposed threads, and said outer cap is sealed to the container proximate the abutment means with an annular bacteria-tight bond with the threads of the outer cap being in axial alignment with the abutment means, said jacking ring being internally threaded and threadingly disposed on the outer cap to guide it toward the abutment means for exerting a pressure against the abutment means to axially pry the outer cap apart at its frangible section.

3,923,184

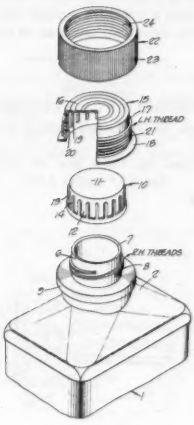
DOUBLE SCREW CAP SYSTEM FOR STERILE MEDICAL LIQUID CONTAINER AND METHOD OF OPENING SAME

Pradip V. Choksi, North Hollywood, and Roy B. Steidley, Seal Beach, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 7, 1973, Ser. No. 338,671
Int. Cl. B65d *55/02*
U.S. Cl. 215—251 **9 Claims**

1. A container with inner and outer closures for storing and dispensing sterile liquids, which includes a blow molded thermoplastic container with a dispensing outlet, said container and outer closure forming a unit that has a transverse abutment means surrounding the outlet, wherein the improvement comprises:

a threaded dispensing neck on the container; a threaded inner closure connected to the dispensing neck and forming a hermetic seal therewith to create a sealed unit; a separately formed injection molded outer cap with a longitudinal axis; said outer cap having both a thin frangible section and externally exposed threads, and said outer cap is sealed to the container proximate said abutment means with an annular bacteria-tight bond with the threads of the outer cap being in a predetermined alignment with the abutment means whereby said threads can receive a threaded opening member and guide it toward the abutment means for exerting a pressure against the abutment means to axially pry the outer cap apart at its



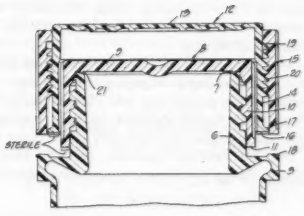
frangible section; and rotational stop means on the outer cap and inner closure to prevent rotation of the outer cap relative to the inner closure.

3,923,185

POURING CONTAINER WITH DOUBLE CAP PROTECTOR FOR STERILE DISPENSING LIP

Pradip V. Choksi, North Hollywood, and Roy B. Steidley, Seal Beach, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 7, 1973, Ser. No. 338,672
Int. Cl. B65d *41/32*
U.S. Cl. 215—253 **11 Claims**



1. A container and double closure providing a system for storing and dispensing sterile liquids, which system includes a blow molded thermoplastic container with a dispensing outlet, an inner closure, an outer cap, and a jacking ring, the container and outer cap forming a unit that has transverse abutment means surrounding the outlet, wherein the improvement comprises:

a threaded tubular container neck with a pouring lip surrounding the dispensing outlet; a manually removable inner cap being said inner closure with an internally threaded skirt that has a lower end surface, and this inner cap is threadingly disposed on the tubular neck; said outer cap being a separately formed injection molded cap with a longitudinal axis, said outer cap having both a thin frangible section and externally exposed threads, and said outer cap has a skirt and is sealed to the container proximate the abutment means with an annular bacteria-tight bond to form a hermetically sealed enclosure which encases the inner cap including the lower end surface of the inner cap skirt, and

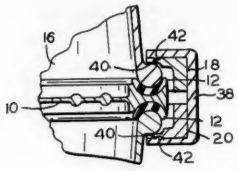
the threads of the outer cap are in axial alignment with the abutment means, whereby said outer cap threads can receive said jacking ring and guide it toward the abutment means for exerting a pressure against the abutment means to axially pry the outer cap apart at its frangible section.

3,923,186

SEALING ASSEMBLY FOR REUSABLE BARRELS

Robert D. Flanders, 18040 Lower Boones Ferry Road, Tigard, Oreg. 97223

Filed Jan. 10, 1974, Ser. No. 432,183
Int. Cl.² B65D *7/02*
U.S. Cl. 220—5 R **12 Claims**



1. In a reusable barrel assembly of the type having a pair of substantially identical shell-like barrel half sections, each having a closed end and an open end, with a sealing means for detachably joining said ends of said barrel sections together with the respective interiors of said barrel sections facing one another, the improvement wherein said sealing means comprises:

a. a pair of projecting flanges extending peripherally around the respective open ends of said barrel half sections;

b. a pair of resilient annular gaskets for insertion between said flange pair;

c. a central stiffener member in the form of a thin annular disc for insertion between said two resilient gaskets;

d. a plurality of unitary C-shaped clamp means spaced around the periphery of said flange pair of releasably holding said flange pair in non-contacting close proximity with said gaskets compressed between said central stiffener member and said flange pair; and

e. means associated with said flange pair and said clamp means for interlockingly engaging said flange pair and clamp means while permitting said clamp means to be detached from both barrel sections by the pressing of said barrel sections together momentarily to increase the compression of said resilient gaskets, thereby freeing both flanges of said flange pair from engagement with said clamp means.

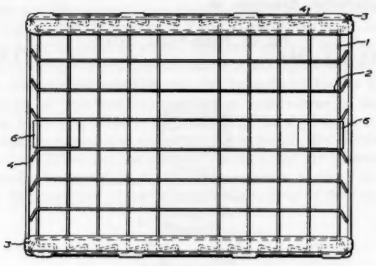
3,923,187

WIRE BASKETS

Karl Olof Johansson; Alvar Erling Nilsson, both of Falkenberg, and Hans TorBjörn Skarfelt, Habo, all of Sweden, assignors to Munksjo Aktiebolag and Pelly AB, Sweden

Filed Nov. 4, 1974, Ser. No. 520,917
Claims priority, application Sweden, June 25, 1973, 7308904; June 25, 1973, 7308905; Nov. 5, 1973, 7314969; Oct. 14, 1974, 7412887
Int. Cl.² B65D *7/20*
U.S. Cl. 220—19 **8 Claims**

1. A wire basket intended for stacking on top of and nesting in at least one other substantially identical wire basket, wherein wires forming side walls of said wire basket are bent at an angle to a bottom plane of said wire basket in order that one pair of opposite side walls shall incline toward one another while the second pair of opposite side walls shall incline away from one another, and means are arranged along each of the side walls inclined toward one another, which means are adjustable between a first position in which they permit nesting of wire baskets in each other and a second position in which they permit stacking of wire baskets on top of each other.

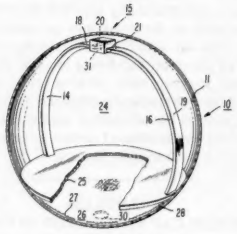


3,923,188

SATELLITE PROPELLANT MANAGEMENT SYSTEM

Ralph Jones Lake, Jr., Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 12, 1973, Ser. No. 426,667
Int. Cl. B65d *85/00*
U.S. Cl. 220—20 **6 Claims**



1. A storage container comprising:

an input port for admitting two fluids one of said fluids being a liquid and having a preferential wetting property greater than the other of said two fluids;

an outlet port for withdrawing a selected one of said two fluids;

first partition means having opening means and disposed within said container for partitioning said container into first and second cpmpartments;

second partition means disposed within said container for partitioning said second compartment to form an inner and an outer compartment relative to said container;

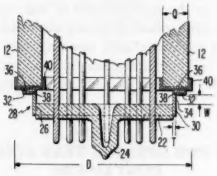
tubular means arranged in communication with said opening means for providing fluid communication between said first and second compartments, said tubular means having a sidewall foraminous surface with apertures to support capillary wicking of liquid threthrough;

said foraminous sidewall facing the inner surface of said container and spaced therefrom a distance sufficient to support a capillary fillet of a liquid.

3,923,189
QUARTZ TO GLASS SEAL

Richard Dale Faulkner, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed July 12, 1973, Ser. No. 378,516
Int. Cl. H01j *17/18, 61/36*
U.S. Cl. 220—2.3 R **3 Claims**



1. A quartz-to-glass seal for sealing an annular open end portion of tubular quartz envelope to a glass stem in an electron tube wherein the annular open end of the envelope has an approximate outside diameter within the range of 0.5 to 2.0 inches; and wherein the seal includes an intermediate metallic stress relieving ring, between the annular open end portion of the envelope and the glass stem, of a material selected from the group consisting of: molybdenum, tungsten, and alloys of cobalt, iron, and nickle, and having:

a. a flange portion with a radial sealing surface plated with a noble metal which is sealed to the annular open end of the quartz envelope by a yieldable cement;

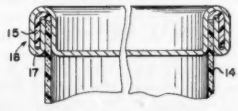
b. a supporting thin narrow tubular stress relieving portion having an approximate longitudinal width within the range of from 0.183 to 0.25 inches, an approximate thickness of between 5 and 15 mils; said relieving portion extending substantially perpendicular from said radial flange portion as a tubular extension of said envelope, and

c. a stem sealing portion extending from said tubular stress relieving portion and sealed to said glass stem.

3,923,190
PLASTIC CONTAINERS HAVING IMPROVED PHYSICAL PROPERTIES FABRICATED FROM A COMPOSITE BILLET

Donald J. Roth, Chicago Heights, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 13, 1974, Ser. No. 469,486
Int. Cl.² B65D *7/42;* **B32B** *27/40*
U.S. Cl. 220—67 **13 Claims**



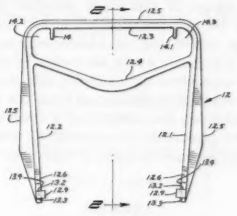
1. A container for packaging food products comprised of a hollow body closed at one end and terminating in an upper end surrounded with a peripheral flange integral with the body and adapted to receive an end closure, the flange being formed from a thermoplastic resin and the body being formed from a thermoplastic resin modified with a second material which imparts lower gas permeability to the thermoplastic resin, the flange being devoid of the second material.

6. The container of claim 1 wherein the container body is formed of a laminate of a layer a first thermoplastic resin having high gas permeability and a layer of a second resin having low gas permeability selected from the group consisting of vinylidene chloride polymers, nylon and acrylonitrile copolymers having an acrylonitrile content of at least 60% by weight.

3,923,191
WAFER BASKET AND HANDLE

Douglas M. Johnson, Carver, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed Sept. 11, 1974, Ser. No. 504,903
Int. Cl.² B65D *25/28;* **B65G** *9/00*
U.S. Cl. 220—94 R **5 Claims**

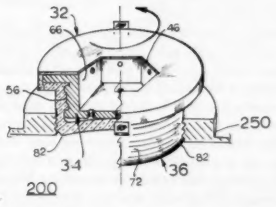


1. In combination, a wafer basket and an easily attachable and detachable handle therefor, the basket having generally upright side and end walls and an open top, the end walls having their upper surfaces centrally recessed to provide each wall with spaced, upright, opposing edges, each wall having aligned, outwardly open transverse slot closely adjacent the top of the basket and the junctures of the end and side walls; and the handle having a pair of stiff, upright legs and leg manipulating means joining upper ends of the legs and spacing the legs to span the basket end-to-end, each leg including at its lower end basket gripping means comprising a transverse bar receivable in the transverse slots of the respective end wall of the basket, the lower end of the leg including upright edges oriented with respect to the transverse bar to confront the upright edges of the basket end wall when the transverse bar is seated in the slot to restrain side-to-side movement of the handle with respect to the basket, the transverse bars of the legs engaging the slots adjacent the upper corners of the basket to stably lift and support the basket.

3,923,192
CONTAINER APERTURE ADAPTORS

Tom Walters, 2102 Mason Blvd., Point Pleasant, W. Va. 25550

Filed Sept. 23, 1974, Ser. No. 508,249
Int. Cl.² B65D *53/00, 41/32*
U.S. Cl. 220—235 **16 Claims**



1. In combination with a pair of telescoping bucket type members telescopable one within the other on a common axis, the outer member of expandable retractable material with its outer configuration providing means to aid in the subsequent closing telescoping clamping, expanding and positioning/locking action with and for the inner telescoping member while its

outer configuration provides means to aid in the subsequent clamping riveting seal feature within the aperture and about its boss, the inner member of firm material having an outer configuration providing positioning/locking, seizing and clamping means within said outer member at the subsequent closing telescoping riveting seal action while its inner configuration includes means for the subsequent unit removal as well as air passage holes functional in conjunction with a plastic type cover cap third member which is pre-affixed onto the clamping flange of said member, which has peripheral air passage channels that in conjunction with the inner member's air passage holes for the subsequent release of air from between the inner and outer members at the subsequent telescoping closure action and positioning means for affixing onto the clamping flange of said inner member and a snap-on means for the subsequent securing to the outer member's clamping flange, whereupon the telescoping closure action the inner member is seated in a selected locked position within the outer member expanding and clamping said member to effect a riveted seal within an aperture and upon the opposing faces of the boss containing the aperture of a container or the like thus the closure assembly is a complete and independent closure unit for the various types of apertures.

3,923,193

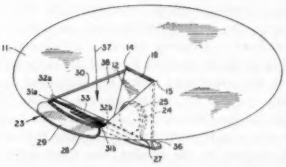
EASY-OPEN CONTAINER WITH NONDETACHABLE LOCK-IN TAB

Robert A. Wells, 4450 Harris Trail, NW., and Carl J. Strobe, 5515 Whitner Drive, NW., both of Atlanta, Ga. 30327

Continuation of Ser. No. 366,586, June 13, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,738

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—269 **9 Claims**



1. Easy opening container with nondetachable opening member, comprising:

a container member;

an opening tab having a periphery defined in said member in part by a severable tearaway region of relative weakness and in part by a non-tearaway region forming a bendable interconnection between the opening tab and the remainder of the container member, so that an opening is established in the container member when the tearaway region is severed and the opening tab is displaced into the opened container by bending along the bendable interconnection;

said opening tab having a forward end which is in spaced apart relation with said bendable interconnection, and which occupies a forward end of said opening;

a handle closely overlying said opening tab and attached to said opening tab at a location thereon disposed between said bendable interconnection and said forward end;

deformably bendable means attaching said handle to said opening tab to provide a first portion of said handle which extends beyond said bendable attaching means to overlie said forward end of said opening tab;

said handle having a second portion which extends on the opposite side of said bendable means from said first portion, and which terminates in a means for grasping the handle;

said bendable attaching means being operative to deform to allow said forward end of said opening tab to be severed and then bent into the container by first handle portion in response to rotation of said handle by moving said grasping portion away from said container member to rotate the handle about a fulcrum provided by said bendable attaching means;

said handle configured to be substantially enterable into the forward end of said container opening as the remainder of said tearaway region is severed by movement of the handle into the opening; and

retaining means disposed on said handle adjacent said grasping portion to engage said container and to secure said handle at the forward end of said opening when the handle has substantially entered the opening, so that said handle and said attached opening tab are maintained within the opened container by said securement of the handle at the forward end of the opening.

3,923,194

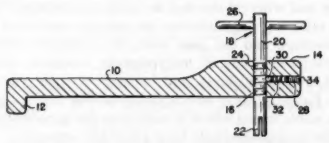
DEVICE FOR OPENING TEAR STRIP TYPE CONTAINERS

Maurice F. Carlson, 6345 Oakman Blvd., Dearborn, Mich. 48126

Filed Mar. 14, 1975, Ser. No. 558,483

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—275 **3 Claims**



1. A device for opening tear strip type containers comprising an elongated body, a downwardly extending foot on one end of the elongated body, a head on the other end of the elongated body with a vertically disposed cylindrical opening therethrough, a rod rotatably supported in the vertically disposed cylindrical opening, a plurality of annular grooves on the rod, a spring loaded detent for selective supportive engagement in the annular grooves on the rod, means on the lower end of the rod for holdably engaging the free end of the tear strip on the container, and means on the other end of the rod for applying thereto a turning force of sufficient magnitude to remove the tear strip from the container and coil it around the rod.

3,923,195

SEALED INDICATOR MECHANISM

John Bernard Wallace, Ickenham, England, assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 29, 1974, Ser. No. 464,946

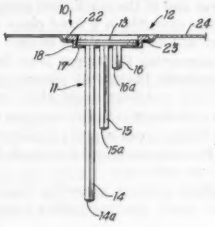
Claims priority, application United Kingdom, May 4, 1973, 21465

Int. Cl.[2] G01F *23/02*

U.S. Cl. 220—309 **2 Claims**

1. An assembly sealing a circular opening in a panel aperture comprising a cup-shaped seal formed from a relatively resilient material disposed in the panel aperture and a disc-shaped plate formed from a substantially rigid material, said seal including a base, a side wall joined to the base and having a substantially cylindrical external surface to facilitate insertion into the panel aperture and cooperating with the base to define a plate-receiving cavity having a depth substantially greater than the thickness of the panel and a circumferential flange extending radially outwardly from the end of the side wall opposite the base, which flange overlies the outer surface of the panel adjacent the rim of the aperture therein, the internal portion of the side wall defining the cavity having an inwardly directed protrusion extending toward the central axis of the cavity, the plate having a thickness substantially greater than the thickness of the panel at the aperture therein and a diameter greater than the diameter of the cavity in the seal, the plate being seated in the cavity and compressing the side

wall of the seal against the rim of the panel aperture and expanding portions of the wall at the protrusion outwardly beneath the inner surface of the panel adjacent the aperture therein, and said plate being seated against the base of the seal



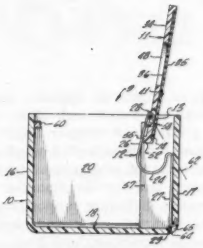
and having a shoulder defining a retaining surface which lies substantially parallel to the inner surface of the panel and compresses the material of the wall of the seal between said surface and the inner surface of the panel adjacent the aperture therein.

3,923,196

CONTAINER WITH SPRINGLOADED CLOSURE

Donald J. Miller, Costa Mesa, and Gil G. Rolle, Wilmington, both of Calif., assignors to Synergex Corporation, Santa Clara, Calif.

Filed Apr. 8, 1974, Ser. No. 458,569
Int. Cl.² B65D *43/24*
U.S. Cl. 220—335 **14 Claims**



1. A closable box, comprising:

a. a container, having at least two sides, a back, a bottom, and an open top,

b. a cover, having a hinge line,

c. hinge means for hinging said cover to said container for pivotal movement about said hinge line between a closed position at which said open top of said container is substantially covered and an open position at which there is substantially free access to the inside of said container,

said hinge means including hinge points on said hinge line at opposite sides of said container, said hinge points being spaced forwardly of the back ends of said sides to cause the portion of said cover rearward of said hinge line to project into said container when said cover is in its open position, thereby permitting opening of said cover when it is in its closed position by pressing inwardly on said portion of said cover rearward of said hinge line, and

d. spring means for urging said cover into either of said closed and open positions when said cover is close thereto and for retaining said cover in either of said positions when said positions are reached,

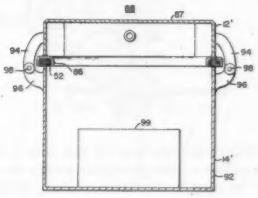
said spring means including an elongate spring element contained within said container and attached at one end to said cover forwardly of said hinge line and at its other end to said container, said spring element being continuously tensioned to hold said cover in position relative to said container, and spring element being shaped and connected to cause a line along the spring line of force to be rearward of said cover hinge line when said cover is in said open position, and to be forward of said hinge line when said cover is in said closed position.

3,923,197

GASKET ASSEMBLY FOR ENCLOSED ELECTRICAL APPARATUS

Edmund W. Kuhn, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1974, Ser. No. 438,059
Int. Cl.² B65D *53/00*
U.S. Cl. 220—344 **5 Claims**



1. A fluid tight container, comprising:

first and second members, each of said first and second members having an edge portion;

a picture frame channel member, said pictire frame channel member when viewed in cross section having a bottom portion with inner and outer surfaces and two spaced side portions said outer surface of said bottom portion of said channel member being affixed to said edge portion of said first member in fluid tight cooperation; and

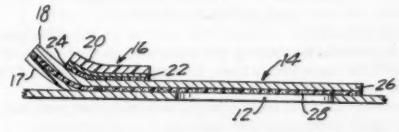
a picture frame resilient gasket member having a central opening when viewed in cross section, said picture frame resilient gasket member being disposed in said picture frame channel member between said spaced portions, a first portion of said picture frame resilient gasket member being disposed on said inner surface of said bottom portion thus providing a first seal thereat, said edge portion of said second member being disposed against another portion of said picture frame resilient gasket member within said channel member thus providing a second seal thereat, said central opening being changeable in shape to accommodate gasket shape change as the result of the presence of said first and said second seals.

3,923,198

STRESS-OPACIFIABLE TAMPER INDICATOR

Wilfred R. Brochman, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 397,876, Sept. 17, 1973, abandoned. This application Aug. 21, 1974, Ser. No. 499,279
Int. Cl.² B65D *41/00*
U.S. Cl. 220—359 **8 Claims**



1. In a container sealed by means of a tape closure, the improvement which comprises:

at least a portion of the closure surfaced with an indicator

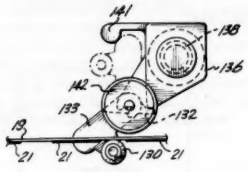
strip comprising a stress-opacifying colored backing;
whereby when said indicator layer is flexed to open said closure, said backing will become opaque and display a color difference between the flexed and unflexed portions indicating said flexing even if said covering is returned to its previous sealing position.

3,923,199

LABEL STRIPPING APPARATUS FOR USE WITH LABEL HANDLING APPARATUS

Kenneth A. Real, Redmond, Wash., assignor to Interface Mechanisms, Inc., Mountlake Terrace, Wash.

Filed Oct. 3, 1973, Ser. No. 403,278
Int. Cl.² B65C 9/18
U.S. Cl. 221—73 **2 Claims**



1. A label stripping apparatus for use with a label handling apparatus including a base plate and means mounted on the base plate for moving, under tension along a first path, label stock comprising a plurality of labels positioned along a strip of label stock backing, said label stripping apparatus comprising:

a. a label stock guide means including a support member and first and second guide members, said first and second guide members being spaced apart from each other on said support member and extending in a substantially parallel direction to each other from said support member, said second guide member having a longitudinal axis aligned with said substantially parallel direction,

b. means mounting said label stock guide means on the base plate for rotation about an axis coincident with said longitudinal axis of said second guide member between first and second positions so that said first and second guide members are transverse to the first path of the label stock, and positioning said label stock guide means with respect to the first path so that the label stock extends along said first path between said first and second guide members when said label stock guide means is in said first postion, and the label stock is moved away from said first path when said label stock guide means is rotated to said second position wherein said first guide member moves the label stock into contact with the second guide member to distort the label stock about said second guide member to separate at least a portion of a label adjacent said second guide member from the label stock backing, and,

c. means for moving said label stock guide member between said first and said second positions.

3,923,200

FEEDER FOR SLEEVE-ENCLOSED EDIBLE CONES

Joseph J. Miller, Pickerington, Ohio, assignor to Big Drum, Inc., Columbus, Ohio

Filed June 3, 1974, Ser. No. 475,980
Int. Cl.² B65G 59/10
U.S. Cl. 221—221 **12 Claims**

1. Apparatus for feeding containers of conical or frustoconical form successively from the lower end of a stack of the nested containers comprising:

a stacker having a guide passage receiving and positioning a stack of the nested containers;

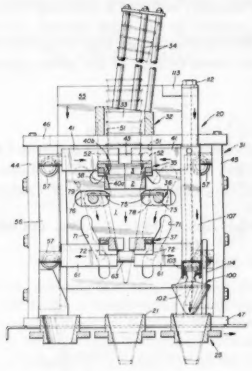
an upper jaw assembly at one level below the stacker guide passage and comprising opposed container-engaging jaws on opposite sides of the positioned stack;

a lower jaw assembly at a still lower level and at a predetermined distance below the first level and comprising container-engaging jaws on opposite sides of the positioned stack;

means for supporting the lower jaws for movement in a first common horizontal plane towards and from each other, into and out of engagement with the lowermost container at the lower end of the stack, said means including lower support bars movable in a fixed plane towards and from each other and carrying a pair of cam followers;

means for supporting the upper jaws for movement in a second common horizontal plane parallel to the first plane towards and from each other, into and out of engagement with the next higher container of the stack, said means including upper support bars movable horizontally in a fixed plane towards and from each other and carrying a pair of cam followers;

an intermediate stripper assembly disposed between the upper and lower jaw assemblies comprising a pair of



opposed stripper fingers on opposite sides of the stack extending inwards towards each other, means for supporting and guiding, the stripper fingers in a common horizontal plane for movement towards and from each other into and out of engagement with the said next higher container and for simultaneous vertical movement, said means incluuding support rods mounted on horizontally reciporcable guides and carrying cam followers for composite movement both horizontally and vertically between said upper and lower support bars; and

control means comprising upright fixed cam plates having pairs of cam grooves cooperatively engaging the cam followers on said stripper support rods, upright movable cam plates mounted for vertical reciprocation relative to said fixed cam plates and having respective pairs of cam grooves cooperatively engaging the cam followers of said support bars for said upper and lower jaws and carrying said horizontally reciprocable guides for said stripper support rods, and means for reciprocating said movable cam plates relative to said fixed cam plates for moving said lower jaw supporting means, said upper jaw supporting means and said stripper finger supporting means and said stripper finger supporting means to operate in the following sequence:

1. move the lower jaws horizontally inwardly into engagement with the lowermost container of the stack to support the stack;
2. move the upper jaws horizontally outwardly out of engagement with the next higher container of the stack to release the stack after support by the lower jaws;
3. move the stripper fingers vertically to an upper position adjacent the upper jaws and horizontally outwardly to positions on opposite sides of the upper jaws;
4. move the upper jaws horizontally inwardly into engagement with the next higher container of the stack to

support the stack;

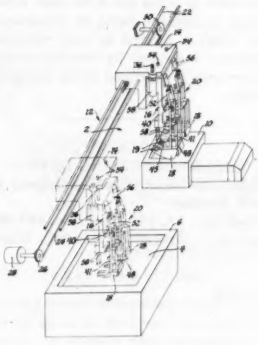
5. move the lower jaws horizontally outwardly to release the said lowermost container after the next higher container is engaged by the upper jaws; and
6. move the stripper fingers horizontally inwardly and vertically downwardly to engage the released lowermost container.

3,923,201

DIPPING LADLE WITH LEVEL RESPONSIVE FILLING OPERATION

David A. Hersh, Saginaw, Mich.; Robert L. Fye, Bedford; Kenneth W. Whitworth, Mitchell, both of Ind., and William E. Willis, Frankenmuth, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1974, Ser. No. 500,059
Int. Cl.² B22D *39/00, 41/06*
U.S. Cl. 222—64 6 Claims



1. Ladle apparatus for transferring a measured quantity of molten metal from a holding vessel into the cavity of a mold comprising:

a first carriage mounted for reciprocating horizontal movement between a first carriage fill position over said vessel and a first carriage pour position over said mold;

a second carriage mounted on said first carriage for vertical reciprocating movement between an upper ladle transfer position and a lower ladle fill position, said second carriage having probe means associated therewith;

a ladle having a pouring spout on one side thereof and a fill edge on the opposite side thereof;

linkage means pivotally connecting said ladle to said second carriage and tiltably supporting said ladle and being operative to tilt said ladle to a rearward fill position to a level transfer position and through a plurality of forward pour positions; and

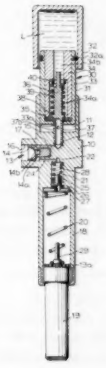
power means operative to sequentially move said first carriage to said first carriage fill position over said vessel, to tilt said ladle to a fill position, to lower said second carriage from said upper position to said fill position so as to immerse the said rearward edge of said ladle, to raise said second carriage to said second carriage transfer position, to tilt said ladle to said ladle transfer position, to move said first carriage to said first carriage pour position and to tilt said ladle through said pour positions, said probe means being associated with said power means and operative to limit the descent of said second carriage in relation to the molten metal level so as to immerse the ladle a predetermined distance to avoid immersion of said linkage.

3,923,202

NON-SPITTING LIQUID DISPENSING DEVICE WITH PRESSURIZED PRODUCT SUPPLY

Pasquale R. Riccio, Salem, N.H., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 29, 1973, Ser. No. 419,967
Int. Cl.² B67D *5/54*
U.S. Cl. 222—145 6 Claims



1. A device for dispensing a spray of fine droplets of liquid in gas comprising a dispenser body, said dispenser body having a nozzle means opening out of said body and having a central outlet passage closed on the end remote from the end opening out of the nozzle means and lateral passages opening into said central outlet passage, said dispenser body having an annular mixing chamber around said central outlet passage to which said lateral passages are connected, a source of liquid to be dispensed having means for mechanically pressuring said liquid and operatively associated with said dispenser body, said dispenser body having a product flow conduit therethrough from said source of pressurized liquid to said annular mixing chamber, and a source of gas under pressure operatively associated with said body and said body having a compressed gas flow conduit therethrough separate from said product flow conduit and extending from said source of gas under pressure and opening into said annular mixing chamber at a point spaced from the point at which said produce flow conduit opens into said annular mixing chamber.

3,923,203

TAP FOR AN HERMETICALLY SEALED CONTAINER

David L. Anderson, Jr., 2930 19th St., Bakersfield, Calif. 93301

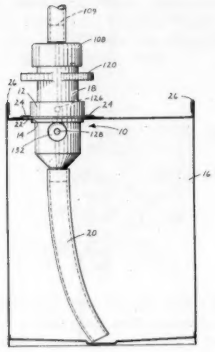
Filed June 14, 1974, Ser. No. 479,355
Int. Cl.² B67D *5/02*
U.S. Cl. 222—153 18 Claims

1. A tap particularly adapted to be seated in the discharge orifice of an hermetically sealable container and function in a first mode for hermetically sealing the orifice and in a second mode for facilitating the discharge of liquid contents from the container comprising:

A. a valve body adapted to be inserted into the discharge orifice of an hermetically sealable container and affixed thereto including an axially extended sleeve and a collar for supporting said sleeve in said discharge orifice including a closure plate affixed to the lowermost end of said sleeve in transverse relation therewith, having a pair of spaced ports defining a first fluid passageway, and valving means displaceable between a valve-open position and a valve-close position relative to said first passageway including a ported block telescopically related to said

sleeve and supported thereby for oscillatory motion relative thereto between a closed position and an open position, and means defining a pair of spaced bores extended through said ported block in communication with said pair of ports when said ported block is in said open position;

B. a fluid delivery body having means defining therein a second fluid passageway extended therethrough including



means for connecting said valve body with a remote source of vacuum, and means for introducing atmospheric pressure into said container as contents are discharged therefrom;

C. removable coupling means for releasably connecting said fluid delivery body with said valve body; and

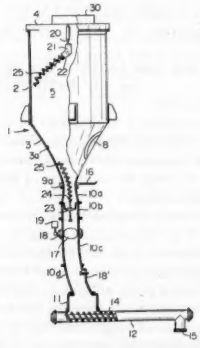
D. means responsive to motion imparted to said movable coupling means for displacing said valving means to a valve-open position.

3,923,204

APPARATUS FOR STORAGE AND DISCHARGE OF FLOWABLE SOLID MATERIALS

Yasuhiro Kato, 808 Shigaichi-Jutaku, 117 Jinmei-cho, Chiba, Japan

Filed Apr. 25, 1974, Ser. No. 464,115
Claims priority, application Japan, Apr. 27, 1973, 48-47206
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—228 **16 Claims**



1. An apparatus for storage and discharge of flowable solid materials which comprises:

a storage tank having upper and lower portions and extending in an axial direction, wherein the upper portion has a space for storing flowable solid materials and the lower portion has a zone for discharging flowable solid materials;

a discharge mechanism disposed in the interior of said storage tank, wherein said discharge mechanism includes a drive shaft disposed in the upper portion of said storage tank in the axial direction of said tank;

an end member mounted rotatably on said discharge zone of the storage tank through a bearing mechanism and a spiral spring member, one end of which is fitted to said drive shaft and the other end of which extends to said end member;

a coupling mechanism for connecting the drive shaft to the shaft of a reduction gear, said coupling mechanism having a space in which said drive shaft is fitted to move vertically and having a slot extending therein in the vertical direction, said drive shaft being engaged with said coupling mechanism by a pin inserted through said slot and a spring disposed in the interior of said space receiving said drive shaft to press the drive shaft downwardly;

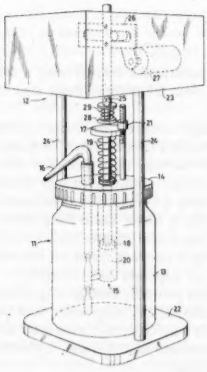
said discharge mechanism being so constructed that when said drive shaft is rotated by said reduction gear, said spring member is rotated by rotation of said drive shaft and concurrently is revolved along the inner wall of the storage tank.

3,923,205

LIQUID DISPENSING DEVICE

Erik Lars Öhlin, Stocksund, Sweden, assignor to Swelab Instrument AB, Sweden

Filed Mar. 18, 1974, Ser. No. 452,063
Claims priority, application Sweden, Mar. 29, 1973, 7304419
Int. Cl.[2] G01F *11/06*
U.S. Cl. 222—309 **4 Claims**



1. A device for repetitively dispensing a predetermined quantity of liquid, comprising:

a. a dispenser including a positive-displacement pump having an operating member, said operating member being displaceable between an advanced position defined by a stop and a retracted position defined by an adjustable stop, and means biasing said operating member toward the retracted positon; and

b. an assembly including a base for removably supporting said dispenser, a power-operating driver movably supported on said base for movement between an extended position and a withdrawn position, the distance between said positions of said driver exceeding the distance be-

tween said positions of said operating member, and a pusher member slidably carried on said driver for engaging said operating member to displace it to said advanced position of said operating means and for accommodating the difference in said distances, said pusher having a bias toward its extended position exceeding that of said biasing means.

3,923,206
SEED SEPARATOR WITH ADJUSTMENT FOR DIFFERENT SEED SIZES

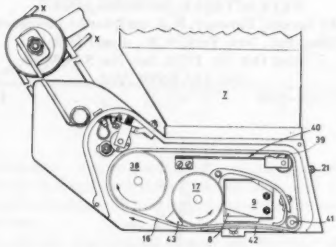
David Gillies, Lyminge, and Robert Anthony Willis, Hythe, both of England, assignors to Stanhay (Ashford) Limited, England

Filed Sept. 13, 1973, Ser. No. 396,696

Claims priority, application United Kingdom, Nov. 16, 1973, 33765/73

Int. Cl.² A01C *7/04*

U.S. Cl. 222—371 **2 Claims**



1. Seed spacing means comprising a seed container operatively connected so as to feed seed to a seed chamber, the chamber having an endless seed conveyor passing therethrough from front to rear in direction of motion, at least one row of longitudinally spaced apertures in the seed conveyor forming cavities for the retention of seed when passing over and upon a spring base means located beneath said conveyor, rotatable seed rejection means rotating in a direction opposite to that of said seed conveyor for ejection of excess seed, the space relationship between the spring base and seed conveyor being such that the seed remains within said cavities and does not project above the surface of said seed conveyor, means at the end of said spring base means through which said seed is discharged from said seed chamber, said seed spacing means being located upon an elongated support framework towably mounted on front and rear wheels.

3,923,207
MICROLITER SYRINGE FOR DISPENSING SMALL, ACCURATELY MEASURED QUANTITIES OF FLUID SPECIMENS

Tuneyoshi Kyogoku, Fujinomiya, Japan, assignor to Jintan Terumo Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1974, Ser. No. 454,838

Claims priority, application Japan, Mar. 29, 1973, 48-38040

Int. Cl.² G01F *11/00*

U.S. Cl. 222—386 **7 Claims**

1. A microliter syringe for dispensing small, arcuately measured quantities of fluid specimens, comprising:

a syringe body having a small bore therethrough;

a cannula mounted on one end of said body and communicating with the said bore;

an elongated plunger of bendable material extending slidably in said bore, the diameters of said plunger and bore being of the order of 0.5 mm whereby said plunger is readily bendable; and

a guide means mounted on the other end of said body with said plunger extending slidably therethrough, said guide means being readily bendable in response to lateral forces on said plunger outwardly of said guide whereby said

guide means prevents kinking of said plunger upon operation of said syringe with the portion of said plunger in said bore being angularly related to the portion thereof extending outwardly of said body.

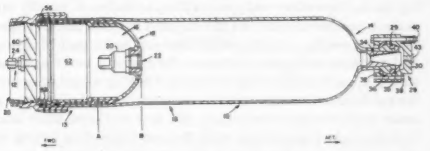
3,923,208
FLUID EXPULSION SYSTEM HAVING A TAPERED TANK

Raymond A. Bergloff, Woodland Hills, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 19, 1974, Ser. No. 490,165

Int. Cl.² B67D *5/46*

U.S. Cl. 222—386 **2 Claims**



1. A fluid dispensing system comprising:

a. a tank having a forward section, an aft section, and an intermediate section between said forward section and said aft section, said forward section of said tank having a larger diameter than said aft section of said tank, said intermediate section being tapered between the two diameters, said aft section having outlet means therein for dispensing liquid from said tank;

b. a piston assembly carried in said forward section of said tank including a piston for displacement therefrom into said aft section, said piston having a hollow interior and an outer diameter greater than the internal diameter of said aft tank section, said piston assembly including aft and forward closed ends, a first fill and drain valve means carried in said aft closed end of said piston in communication with the interior of said piston assembly and said aft section of said tank, a second fill and drain valve means carried in the forward closed end of said piston assembly in communication with the interior thereof and the atmosphere;

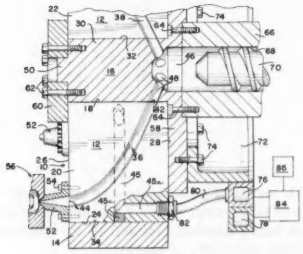
c. gas generator means carried in said hollow interior of said piston for displacing said piston from said forward section into said aft section of said tank whereby responsive to displacement of said piston, the diameter of said aft section expands as a result of increased fluid pressure therein so that the clearance between the piston and tank wall is held constant; and,

d. a shear ring secured to the inner wall of said tank and said piston for releasably securing said piston to said tank, said shear ring disposed for shearing and releasing said piston for the displacement thereof responsive to said gas exerting a force on said piston.

3,923,209
RUNNER MANIFOLD FOR INJECTION MOLDING MACHINE

Siegfried S. Roy, Darien, Conn., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,092
Int. Cl.² G01F 11/00; B28B 1/24; B29F 1/06, 1/08
U.S. Cl. 222—478 17 Claims



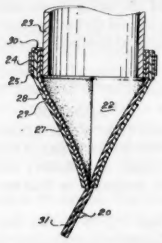
1. A runner manifold for conducting a synthetic resinous material in a flowable state from a source thereof to a plurality of injection nozzles in an injection molding machine, the manifold comprising: a hub member having an outer support surface, means defining concavity in the hub member adapted to communicate with the material source, and means defining a plurality of ports in the hub member in communication with the concavity; a plurality of sector-shaped elements surrounding the hub member and cooperating to define a radially inner surface complementary to the support surface and in engagement therewith, a radially outer surface, and a pair of opposed end surfaces extending between the radially inner and outer surfaces, each sector-shaped element having a pair of opposed lateral faces extending radially between the radially inner and outer surfaces and intersecting the end surfaces, each lateral face being in engagement with the corresponding lateral face of an adjacent sector-shaped element and having an elongate recess formed therein cooperating with the recess in said corresponding lateral face to define a runner passage having an inlet in communication with one of the ports in the hub member, and an inlet at one of the end surfaces; and a clamping ring surrounding the sector-shaped elements and having an inner surface complementary to and to engagement with the radially outer surface defined by the sector-shaped elements.

3,923,210
AUTOMATIC DISCHARGE REGULATOR

Lawrence Donald Alexander Jackson, Montreal, Canada, assignor to Lawjack Equipment Limited, Montreal, Canada

Filed Feb. 21, 1974, Ser. No. 444,508
Claims priority, application United Kingdom, Feb. 22, 1973, 8807/73
Int. Cl.² B65D 37/00
U.S. Cl. 222—494 8 Claims

1. An automatic discharge regulator for a discharge exit from a separator or a classifier comprising a sleeve comprised of two sheets of resilient flexible material in side by side relationship, abutting one another at one end and adapted to sealingly mate with the discharge exit at the other end, said two sheets being sealingly held together along the length of the two opposing edges thereof, two reinforcing pads of flexible, elastic material, respectively, centrally located on and fixedly attached only to the outer surface of each of said two sheets so that each of said two sheets longitudinally extend in the direction of said one end beyond the corresponding said reinforcing pad, said reinforcing pads aiding in resiliently retaining said sheets at said one end in abutting relationship, thereby closing said one end of said sleeve when said regulator is in mating engagement with the discharge exit, the flexible material of said two sheets and of said reinforcing pads having

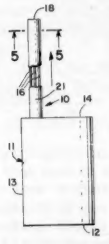


sufficient resilience to allow said one end of said sleeve to be opened by and pass solid particles therethrough.

3,923,211
RETRACTABLE POURING SPOUT

Fred John Spreen, Bayonne, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 10, 1974, Ser. No. 513,883
Int. Cl.² B67D 3/00
U.S. Cl. 222—528 1 Claim



1. In combination a retractable pouring spout and a can, which comprises:
   a. said can having a base, an upwardly extending sidewall, and a top, said top having a circular aperture therethrough;
   b. a bottom annular member of a larger diameter than said circular aperture;
   c. a top annular member of a diameter equal to said circular aperture;
   d. a plurality of rod members communicating between said top and bottom annular members, said rod members and said top annular member slidably through said circular aperture;
   e. a flexible plastic cylindrically shaped sleeve affixed to a bottom surface of said top of said can and a lower surface of said top annular member, said sleeve covering the outside surfaces of said extended rod members; and
   f. a twist top engaging said top annular member protruding above said top of said can.

3,923,212
INFLATABLE HANGER

Robert E. Brunner, 2515 Burnet Ave. No. 1105, Cincinnati, Ohio 45219

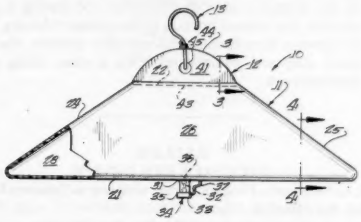
Filed Nov. 4, 1974, Ser. No. 520,446
Int. Cl.² A47J 51/093
U.S. Cl. 223—88 1 Claim

1. An inflatable hanger comprising, in combination:
   a hollow body member of a truncated triangular configuration having a horizontal bottom edge, a horizontal trun-

cated apex top edge extending parallel to the bottom edge, a pair of inclined side edges joining the ends of the top edge to the ends of the bottom edge, a front triangularly shaped wall surface, and a back triangularly shaped wall surface;

said body member being manufactured of a flexible vinyl plastic material having a 6 mil minimum wall thickness; an airtight chamber defined interiorally of said wall surfaces;

a valve body member formed of a resilient hollow open ended elongated cylindrically shaped stem, one end of the stem affixed to said bottom edge portion of said body member intermediate the opposite ends thereof with the opposite end of said stem extending normal to said bottom edge and projecting vertically downwardly therefrom and terminating at a flat bottom neck end surface;



a cylindrically shaped passageway extending axially completely through said stem between said neck end and communicating with said airtight chamber at said opposite end;

a flat circular disc shaped stopper cap having a diameter greater than the exterior diameter of said stem neck end and having a flat outer surface and a flat inner surface and cylindrical side walls;

a solid flexible cylindrically shaped boss member disposed centrally on said stopper member inner surface and extending axially outwardly therefrom concentric therewith, the boss member being of a diameter slightly larger than the diameter of said stem passageway to be snugly received in the neck end portion of said passageway when said stopper cap is placed onto said flat neck end bottom surface of said stem to seal said passageway;

a flexible length of material having one end permanently affixed to a portion of said stopper cap cylindrical side wall surface with the opposite end extending outwardly therefrom and permanently affixed to said bottom edge of said body member to permanently retain said stopper cap with said body member in a manner permitting the stopper cap to be readily affixed to and removed from said stem;

a longitudinally elongated channel member of a U-shaped cross-sectional configuration having a flat bottom surface and parallel side wall surfaces, the bottom surface formed integrally with the truncated apex top edge and extending completely therealong between the opposite ends thereof with said channel opening upwardly therefrom;

a flat tab defining hanger member having a flat front surface, a flat back surface, a horizontal flat bottom edge having a length identical to the length of said channel member, and an arcuate semi-circular curved top edge extending completely between the opposite ends of said tab bottom edge;

said tab member being of a uniform thickness throughout; said tab bottom edge being completely received in said channel member channel with said tab member projecting outwardly therefrom;

adhesive means disposed intermediate said channel member and said tab member for permanently securing said tab hanger member bottom edge to said channel member;

said tab hanger member being manufactured of a rigid plastic material;

a circular aperture extending through said tab member completely between said front and back surfaces thereof;

a hook member formed of an elongated rod shaped body member having one end bent into the shape of a hook with the opposite end extending downwardly therefrom and then bent at a ninety degree angle to pass through said tab member aperture after which it is bent again at a ninety degree angle back onto itself to pass upwardly therefrom in the direction of said hook end and, when passing said curved top edge of said tab member, is bent in a spiral manner about the rod member to permanently affix said hook member to said tab member;

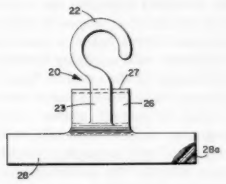
whereby said body member is readily inflated with said hook member utilized for suspending said body member from a closet rod, nail and the like for the hanging and support of articles of clothing thereon.

3,923,213

GARMENT HANGER

Paul J. George, P.O. Box 86, Brecksville, Ohio 44141, and M. Ted Raptes, 2111 Jefferson Davis Highway, Arlington, Va. 22202

Filed Sept. 27, 1973, Ser. No. 401,292
Int. Cl.[2] A47J *51/94, 51/96*
U.S. Cl. 223—96 **4 Claims**



1. A one-piece hanger fabricated from a plastic material for gripping and suspending a garment permitting it to hang freely comprising gripper means, spring-biasing yoke means, and combined hook and gripper separating means:

a. said gripper means comprising a pair of parallel horizontally-extending gripper members, each of said gripper members having an inwardly disposed vertical gripping surface, said gripping surface comprising a planar dimensional area having frictional gripping means, both of said gripping surfaces being normally spring-biased by said yoke means in a parallel closed contacting position;

b. said spring-biasing yoke means having a spring action property and a generally arcuate form, said yoke means being above and between said gripper members and centrally disposed along a portion of the horizontal length of said gripper members, said yoke comprising a medial portion parallel to said gripper means which has a smaller thickness than the remaining thickness of said yoke means;

c. said combined hook and gripper separating means comprising a pair of separate members each extending vertically upwardly from each respective side of said yoke means and normally disposed in parallel relationship, each of said members comprising hook means at the upper extremities thereof;

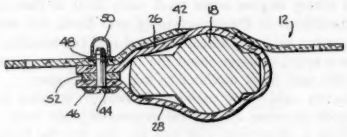
d. said plastic material selected from the group consisting of polyvinylchloride, polystyrene, polyethylene, polypropylene, acrylonitrile-butadiene-styrene, filler reinforced plastics, and fibrous reinforced plastics;

whereby said gripper members can be easily separated by squeezing said combined hook and gripper separating means to thereby enable a garment to be inserted between said gripping surfaces and to be frictionally held therebetween upon release of said combined hook and separating means.

3,923,214
HOLSTER

Albert J. Kippen, Springfield, Mass., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed July 25, 1974, Ser. No. 491,735
Int. Cl.² F41C 33/02
U.S. Cl. 224—2 B 2 Claims

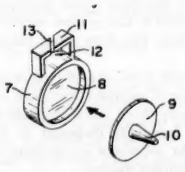


1. A holster for a revolver having a cylinder comprising a holster body having a pair of opposed side walls defining an opening at one end through which the revolver including the cylinder is received for disposition within the holster, each of said side walls having a generally concave pocket formed in the interior surface of said walls, and both concave pockets lying in spaced confronting registry for enclosing the exposed cylinder on each side of the revolver, each of said concave pockets having a distinct upper shoulder for engaging the cylinder at its exposed breech end on each side of the revolver when the revolver is disposed within the holster, the engaging shoulders for yieldably engaging the revolver cylinder to releasably retain the revolver disposed within said holster body against withdrawal forces below a predetermined magnitude of withdrawal force, said engaging shoulders being yieldable to enable withdrawal of the revolver from the holster body in response to a magnitude of withdrawal force above said predetermined magnitude thereof, means carried by said holster body and engaging each of said side walls for adjusting the bearing pressure of said engaging shoulders against the revolver cylinder whereby the predetermined magnitude of the withdrawal force is adjustable, said adjusting means including removable washers and screw means for adjusting the spacing between the opposed sides of said holster body to adjustably transversely space the opposed pockets one from the other, whereby the distance between the pockets may be varied by the number of washers used.

3,923,215
GOLF BALL POSITION MARK ASSEMBLY

Shigeo Suzuki, Tokyo, Japan, assignor to TDK Electronic Company, Tokyo, Japan

Filed June 25, 1973, Ser. No. 373,191
Claims priority, application Japan, Dec. 26, 1975, 47-000247
Int. Cl.² A45F 5/02
U.S. Cl. 224—5 C 2 Claims

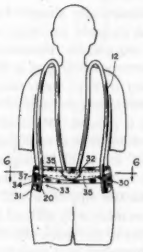


1. A golf ball position marker assembly comprising:
a golf ball position marker comprising a metallic disc with a synthetic resin pointed rod for insertion into the ground projecting from the center of the disc,
a golf ball position marker holder comprising:
a synthetic resin hollow cylinder having its top end open and its bottom end at least partially closed, the bottom end being perpendicular to the side walls of the cylinder,
a permanent magnet positioned to lie within the cylinder and flush against the bottom end of the cylinder,
the golf ball position marker being positioned to lie within the cylinder and flush against the permanent magnet to which it is attracted,
the side walls of the cylinder having a height greater than the combined thicknesses of the permanent magnet and the metallic disc but less than the height of the synthetic resin pointed rod for insertion into the ground projecting from the center of the disc,
U-shaped non-movable holding means integrally mounted to the cylinder to form an opening between the cylinder and the U-shaped holding means to permit passage of a shoe string therethrough to permit attachment of the golf ball position marker assembly to a shoe to permit convenient carrying of the golf ball position marker assembly, the holding means being rectangular shaped and formed at the bottom end of the cylinder and having a groove therein, the bottom portion of the cylinder having a similar groove therein disposed opposite thereto, the oppositely disposed grooves retaining a shoe string passed therethrough.

3,923,216
BACKPACKER'S DEVICE

Fred A. Farnbach, Phoenix, Ariz., assignor to Johnson Diversified, Inc., Racine, Wis.

Filed Nov. 25, 1974, Ser. No. 526,544
Int. Cl.² A45F 3/08
U.S. Cl. 224—8 R 10 Claims

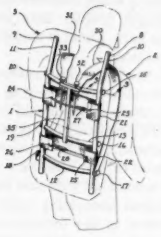


1. A backpacker's device comprising:
a frame structure having a central weight-bearing leg terminating in a lower foot, and two substantially flexible lateral weight-bearing legs, one on either side of said central leg, said lateral legs terminating in lower ends and connected to said central leg remote from said lower foot and lower ends whereby said lower foot and lower ends have relative freedom of movement, said frame structure forming interconnected support columns extending upwardly from said lower foot and lower ends and terminating in shoulder-adjacent portions and generally conforming to the profile of the human back;
a hip-engaging belt, said lower foot secured thereto in position to be adjacent the juncture of a backpacker's spine and pelvis; and
connectors flexibly joining said belt and said lower ends of said lateral legs.

3,923,217
TAKE DOWN BACK PACK

Leslie B. Dean, II, 1412 N. 59th St., Lincoln, Nebr. 68505, and Lance L. Dean, 2852 Tippicanoe Trail, Tucson, Ariz. 85705

Filed Dec. 6, 1973, Ser. No. 422,195
Int. Cl.² A45F 3/08
U.S. Cl. 224—9 3 Claims



1. A take down back pack frame for supporting a payload including a plurality of components assembleable into a shelter structure, said frame comprising:

a. a plurality of vertical members adapted to form a first arch of the shelter structure;

b. a plurality of horizontal members adapted to form a second arch of the shelter structure;

c. means for selectively attaching and detaching said horizontal members to said vertical members to assemble and disassemble said frame, said attaching and detaching means comprising:

1. an aperture extending through each of said vertical members at the point of attachment between said vertical and horizontal members;

2. a tent stake inserted through each of said apertures;

3. an insert disposed within each end of each of said horizontal members for receiving said tent stake, said insert including a passageway for frictionally engaging said tent stake; and

4. means for biasing said vertical members toward one another;

d. a pair of detachable shoulder straps for mounting said frame upon a hiker, said shoulder straps being adapted to guy said first and second arches; whereby, said vertical and horizontal members and said shoulder straps are assembled to form a shelter structure.

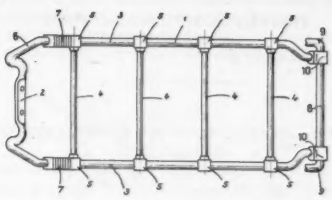
3,923,218
CYCLE LUGGAGE CARRIER CONSTRUCTION, PARTICULARLY LIGHT-WEIGHT BICYCLE LUGGAGE CARRIER

Heinz Niemann, Herford, Germany, assignor to Firma ESGEE-Marby GmbH & Co., Bielefeld, Germany

Filed May 28, 1974, Ser. No. 473,363
Claims priority, application Germany, June 29, 1973, 2333245
Int. Cl.² B62J 7/04
U.S. Cl. 224—32 A 13 Claims

1. Cycle luggage carrier construction having a grid structure defining an article carrying surface, said grid structure being formed by rod-like grid elements comprising longitudinal bar elements (3) and cross rod elements (4), characterized by

molded plastic connecting elements (5) connecting and joining together the cross rod elements and respective longitudinal bar elements (3), forming a single injection molding molded, in place, around said bar elements (3) and the terminal ends of the cross rod elements (4); and wherein the molded plastic connecting elements (5) are

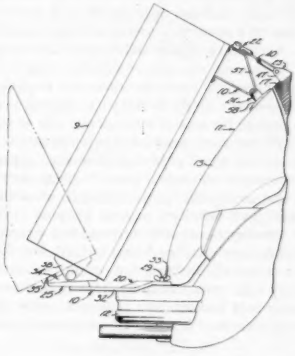


formed with article carrying surfaces on at least one side thereof.

3,923,219
VEHICLE ACCESSORY CARRIER FRAME

Clinton G. Glover, 2556 Linda Vista, and Harold A. Keller, 2001 Linden, both of Clarkston, Wash. 99403

Filed Feb. 28, 1974, Ser. No. 446,598
Int. Cl.² B60R 9/06
U.S. Cl. 224—42.03 A 5 Claims



1. An exterior accessory carrier frame for vehicles of the type having a vehicle body with a ventilation grillwork including a horizontally disposed set of upright elongated slots extending through the vehicle body and a set of horizontally elongated louvers spaced inwardly within the body from the set of upright slots, said louvers being formed along a plane substantially perpendicular to the set of upright slots, said accessory including a pivot mounting at its lower end for pivotal attachment of the accessory to the bumper so that the accessory extends substantially upright during transport but may be pivoted outwardly of the vehicle to permit access to and opening of the adjacent vehicle compartment, comprising:

a bracket assembly adapted to be mounted to the accessory at a location adjacent said set of upright slots when said accessory is supported by the carrier frame;

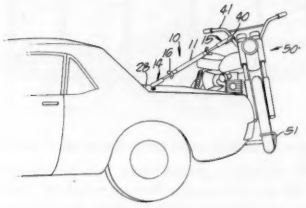
anchor means fixedly mounted to the horizontally elongated louvers and extending outwardly through said upright slots to releasably interengage said bracket assembly to retain the accessory in the transport condition;

and impact absorbing means extending from the bracket assembly on the accessory and engaging a prescribed location on the vehicle body for preventing undesired movement of the accessory relative to the vehicle body.

3,923,220
MOTOR BIKE STABILIZER

Stanley T. Marcyan, 515 W. Windsor Road, Glendale, Calif. 91204

Filed May 24, 1974, Ser. No. 473,131
Int. Cl.² B60R 9/08
U.S. Cl. 224—42.03 B 3 Claims

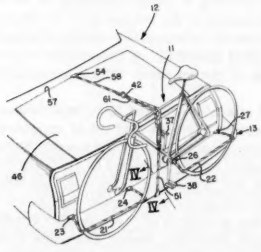


1. A stabilizer device for detachably anchoring a motor bike rigidly stabilized crosswise of the rear of a motor vehicle while being transported, said device comprising a pair of ball coupler sub-units one of which includes means for rigidly mounting the same on the rear of a motor vehicle and the other of which includes means for rigidly mounting the same on the upper part of a motor bike, an elongated rigid stabilizer member having a spherical surfaced socket at each end thereof opening laterally through one side thereof and sized to seat over the ball of a respective one of said ball coupler sub-units to hold a motor bike rigidly stabilized in an upright position crosswise of the rear of a motor vehicle, a manually operable elongated locking jaw pivotally connected to each end of said stabilizer member with the locking end thereof normally positioned to engage the ball of a respective one of said ball couplers to hold the same assembled in a respective one of said spherical sockets, a pair of U-shaped spring keepers one leg of which is insertable through aligned holes at each end of said stabilizer and an adjacent portion of each of said locking jaws to lock said jaws positively against opening so long as said stabilizer member is assembled to said ball coupler sub-units, and said stabilizer member being quickly and fully released from each of said rigidly mounted coupler sub-units by simply withdrawing said spring keepers from said aligned openings and pivoting said locking jaws outwardly away from contact with the adjacent ball of said ball coupler sub-units.

3,923,221
BICYCLE CARRIER

James E. Ballinger, 290 Princeton Drive, Costa Mesa, Calif. 92626

Continuation of Ser. No. 372,663, June 22, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,519
Int. Cl.² B60M 9/10
U.S. Cl. 224—42.03 B 6 Claims



1. A bicycle carrier for removable attachment to either the front hood and bumper or rear trunk lid and bumper of a vehicle, comprising in combination:

a pair of bicycle wheel retaining cable means, one for each bicycle wheel, each having bracket means at the ends thereof for removable fastening to an upper margin of the vehicle bumper and for passing around a lower portion of each bicycle wheel with the bicycle in an upright orientation adjacent the front or rear of the vehicle;

each cable having a length selected to form in conjunction with the adjacent bumper to which it is attached a wheel receiving, elongate horizontal loop bounded on one side by said cable with a width commensurate with that of the wheel and a length smaller than the diameter of the wheel, such that each wheel is supported in both lateral and vertical directions;

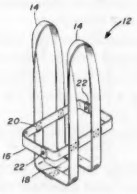
bicycle body cable means having fastening means at the end thereof for removable attachment at one end to a lower margin of said vehicle bumper and for passing upwardly therefrom around a central body portion of the bicycle to a point of attachment at the opposite end of the cable means to the hood or trunk of the vehicle; and

tensioning means associated with said body cable means for applying a constant restraining force to the bicycle for keeping the wheels of the bicycle under tension downwardly in said loops, and means for adjusting said tensioning means.

3,923,222
BAG CARRIER

Richard B. Groves, Colonial Manor Apts. 6F, Chestertown, Md. 21620

Filed Nov. 18, 1974, Ser. No. 524,711
Int. Cl.² B65D 71/00
U.S. Cl. 224—58 3 Claims



1. A flexible bag carrier in the form of a skeleton frame of flexible material strip which when unfolded can be used for carrying and reinforcing shopping bags and which can be folded to a collapsed storage position when not in use, comprising, a pair of continuous elongated flexible material loop strips, one of said flexible loop strips being longer in length than the other of said flexible loop strips, said one of said flexible loop strips having laterally spaced vertical sections with handle means at the upper ends thereof and having transversely extending lower end sections for supporting a bag, the other of said flexible loop strips being formed of a plurality of sides and joined horizontally to said laterally spaced vertical sections of said one flexible loop strip, and a flexible strip for joining said lower end sections of said one flexible loop strip together, the other of said flexible loop strips being provided with a plurality of snap fasteners to allow said bag carrier to be opened wide to place a shopping bag into the bag carrier for support and reinforcing thereof, said flexible loop strips when opened up for storage lying in substantially the same plane.

3,923,223
HOLDER WITH TEAR-OFF MECHANISM FOR WEB-LIKE MATERIAL

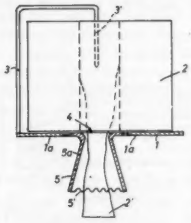
Karl Olof Axel Helmer Larsson, and Lars Lander, both of Industriestrasse 40, CH-6300 Zug, Switzerland

Continuation of Ser. No. 370,575, June 15, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,145

Claims priority, application Germany, Sept. 6, 1972, 2243761

Int. Cl.² B26F *3/02*

U.S. Cl. 225—46 **5 Claims**



1. A holder with a tear-off mechanism for web-like material, especially for paper rolls, comprising a supporting and holding member for the material including a bearing means forming the bottom of the holder and having a central bottom opening through which the material is withdrawn, said bearing means having a substantially planar upper bearing surface and the holder also comprising a tear-off mechanism connected to the supporting and holding member and arranged following and surrounding said central opening in the bearing means, the tear-off mechanism comprising an elongated, conduit of substantially circular cross-section protruding downwardly from the opening in the bearing means and terminating with teeth at its lower end for severing the web-like material at said lower end, said conduit being dimensioned to permit a user of the holder to insert his fingers into the conduit to grip a portion of the web-like material disposed in the conduit.

3,923,224
FILAMENT HANDLING APPARATUS

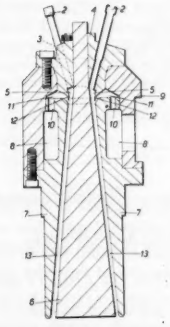
James Brock, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 24, 1973, Ser. No. 363,317

Claims priority, application United Kingdom, May 26, 1972, 24950/72

Int. Cl.² B65H *17/32*

U.S. Cl. 226—7 **16 Claims**



1. A pneumatic spray gun having a plurality of inlet passageways, each passageway being adapted to receive a plurality of filaments in the form of a small bundle, said inlet passageways communicating with a common chamber, a discharge passage extending from said chamber to an outlet, a driving air inlet passageway communicating with said chamber and arranged so that driving air enters said chamber via the driving air inlet and acts on the small bundles of filaments flowing from each of said inlet passageways to entrain the filaments in said discharge passage and to separate the filaments from each other and to discharge the separated filaments from said outlet.

3,923,225
EXPLOSION CHARGE DRIVEN FASTENING ELEMENT SETTING GUN

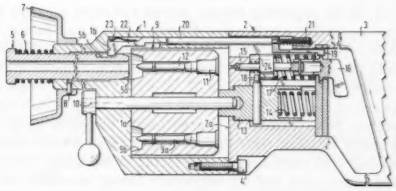
Elmar Maier, Feldkirch-Tisis, and Robert Tilg, Schaan, both of Austria, assignors to Hilti Aktiengesellschaft, Liechtenstein

Filed Dec. 10, 1974, Ser. No. 531,442

Claims priority, application Germany, Dec. 14, 1973, 2362321

Int. Cl.² B25C *1/12*

U.S. Cl. 227—8 **8 Claims**



1. In an explosive charge driven fastening element setting gun comprising a housing having a front end facing in the firing direction and rear end facing in the opposite direction, said housing having a first bore extending from its front end toward its rear end with the rear end of said first bore spaced forwardly of the rear end of said housing and a chamber located at the rear end of said first bore and extending rearwardly therefrom, means arranged in said housing within said first bore and chamber and axially displaceable therein, said means comprising a first part and a second part disposed in a serially arranged manner one behind the other each axially displaceable relative to the other with said first part having its forward end extending forwardly of the front end of said housing, means for biasing said first and second parts in the direction of the forward end of said housing, a breech ring attached to the rearward end of said housing, said second part under the action of said biasing means having its rearward end spaced forwardly of said breech ring, a firing mechanism axially displaceably mounted in said breech ring, said firing mechanism including a firing pin and a spring biasing the firing pin in the direction of the forward end of said housing, said first and second parts forming a bore for firing fastening elements from the setting gun into a receiving material, said first and second parts being axially displaceable rearwardly through said housing by pressing the forward end of said first part against the receiving material in opposition to the action of said biasing means acting on said first and second parts until the rearward end of said second part contacts said breech ring, wherein the improvement comprises latch means for preventing said firing pin from moving in the direction of the forward end of said housing, said latch means operatively connected to said first part and arranged to prevent the movement of said firing pin in the forward direction when said first part is positioned under the action of said biasing means and said latch means releases said firing pin when said first and second parts are displaced rearwardly in opposition to the action of said biasing means.

3,923,226
BARREL AND MAGAZINE ALIGNMENT ARRANGEMENT FOR A FASTENING ELEMENT SETTING GUN

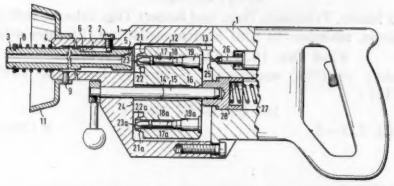
Elmar Maier, Feldkirch-Tisis, Austria, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed Dec. 10, 1974, Ser. No. 531,443

Claims priority, application Germany, Dec. 13, 1973, 2362074

Int. Cl.² B25C *1/12*

U.S. Cl. 227—8 **9 Claims**



1. In an explosive charge driven fastening element setting gun comprising a housing having a front end facing in the firing direction and a rear end facing in the opposite direction, said housing having a first bore extending therethrough rearwardly from the front end, a barrel axially displaceably mounted in said bore in said housing, said barrel having a second bore extending therethrough disposed in generally parallel relation with said first bore and said second bore having a forward muzzle end facing in the firing direction of the setting gun and on oppositely facing rearward end, said housing forming a chamber rearwardly of the first bore and disposed in communication with said first bore, said chamber having a central axis disposed in generally parallel relation with and disposed offset to the axis of the first bore in said housing, a drum-type magazine axially displaceably mounted in said chamber and also mounted for rotation about the central axis of said chamber, said magazine having a plurality of angularly spaced third bores therein disposed in generally parallel relation with the central axis of the chamber and each of said third bores being arranged for general alignment with the first bore in said housing, said magazine having a front face extending transversely of the central axis of said chamber and an oppositely directed rear face, said barrel being displaceable from a non-firing position with the rearward end of the second bore spaced forwardly of said magazine to a firing position with the rearward end of the second bore disposed in contact with the surface of said magazine encircling the front end face of the bore in said magazine which is disposed in general alignment with the first bore in said housing, wherein the improvement comprises that at least one of said barrel at its rearward end within said first bore and said drum-type magazine at its front end within said chamber has a radial clearance relative to said first bore and said chamber, respectively.

3,923,227
TAPERED SEAL BETWEEN THE BARREL AND DRUM TYPE MAGAZINE IN A FASTENING ELEMENT SETTING GUN

Elmar Maier, Feldkirch-Tisis, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

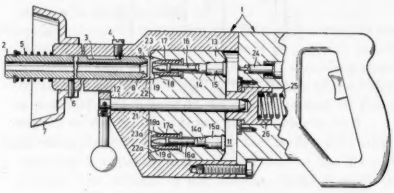
Filed Dec. 10, 1974, Ser. No. 531,444

Claims priority, application Germany, Dec. 13, 1973, 2362073

Int. Cl.² B25C *1/12*

U.S. Cl. 227—8 **6 Claims**

1. In an explosive charge driven fastening element setting gun comprising a housing, a barrel with a bore therethrough having a forward muzzle end and an oppositely directed rearward end, and said barrel being axially displaceably mounted in said housing and movable rearwardly through said housing into the firing position, a drum type magazine mounted in said housing rearwardly of said barrel, said magazine having a forward face extending transversely of the axis of said barrel and facing toward the forward end of said barrel and a rearward face facing in the opposite direction, said magazine having bores therethrough extending in the axial direction of said barrel and arranged to align with said barrel, the rearward end of said barrel and the ends of said bores in said drum adjacent the forward face thereof each have matching tapered surfaces, wherein the improvement comprises that said matching tapered surfaces include a first tapering surface in the rearward end of the bore in said barrel and said first tapering surface diverging toward the rearward end of the barrel, and



a second tapered surface formed within the bore in said magazine with said second tapered surface facing outwardly relative to the axis of the bore in the magazine and disposed inwardly from the surface forming the bore, said second tapered surface converging in the direction of the forward end of said barrel, said second tapered surface arranged in matching relationship with said first tapered surface so that said first and second tapered surfaces seat in substantially contacting engagement with one another when said barrel is displaced rearwardly into the firing position in one of the bores in said drum with the substantially contacting surfaces of said first and second tapered surfaces extending from the interior of the bore in said barrel in the direction away from the forward muzzle end of said barrel.

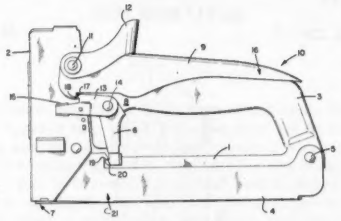
3,923,228
MULTIPLE SHOT FASTENING GUN

Martin Leff, New York, and Paul Olesen, Belmore, both of N.Y., assignors to Swingline, Inc., Long Island City, N.Y.

Filed July 30, 1974, Ser. No. 493,169

Int. Cl.² B25C *1/00*

U.S. Cl. 227—132 **3 Claims**



1. A tool for driving a fastening element into a work piece comprising:

a. a frame including a ram housing;

b. magazine means mounted on the frame for feeding sequentially a plurality of fastening elements to a driving station;

c. spring loaded ram means mounted in the housing on the frame for movement through multiple arming strokes against the force of the spring in a direction away from the driving station and through successive firing shots back toward the driving station under the force of the

spring into driving contact with a waiting fastening element situated at the driving station;

d. movable means engageable with the ram means for advancing the ram means through the arming stroke;

e. release means for effecting disengagement between the ram means and the movable means upon completion of the arming stroke;

f. driving blade means having at least two fastening element driving surfaces said blade means being pivotably attached to the ram means; and

g. guide means associated with said housing engageable with the driving blade means to guide the first of said driving surfaces against the fastening element to complete a first driving shot driving the fastening element through a hole in the stapler housing and to guide the second of said blade surfaces against the fastening element in a successive driving shot to thereby drive the fastening element further into a work piece.

3,923,229

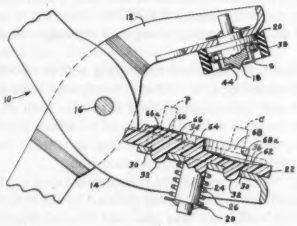
PLIER-TYPE SNAP FASTENER APPLIER

James Brompton Kruger, Oxford, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Jan. 13, 1975, Ser. No. 540,520

Int. Cl.² A41H *37/04*

U.S. Cl. 227—144 **1 Claim**



1. In a snap fastener applier comprising a plier-like tool having a pair of opposing jaw elements, one of the jaw elements presenting a pyramidal punch directed toward the other of the jaw elements, the said other jaw element being provided with a turntable pivotally attached thereto, the improvement wherein the turntable has on either side of the pivotal attachment to the jaw element a pair of cooperant arcuate arms extending laterally of the turntable and integrally formed with the turntable of molded plastic, the arms of each pair being concentric and each of the arms having adjacent its distal end with respect to the turntable an enlarged nib, the arms being disposed partly in a cut-out in the turntable to permit substantial resilience of the arms, the arms being adapted to yield and embrace the head portion of various sizes of eyelets, with the head of the eyelet disposed underneath the nibs to secure it firmly against the turntable.

3,923,230

METHOD OF MAKING A SWIMMING POOL GUTTER

James A. Patterson, and John F. Ogden, both of Columbus, Ohio, assignors to Lifetime Metal Products, Inc., Columbus, Ohio

Filed June 14, 1973, Ser. No. 369,894

Int. Cl.² B23K *31/02;* **E04H** *3/20*

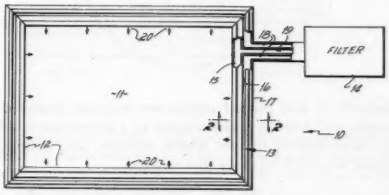
U.S. Cl. 228—141 **4 Claims**

2. The method of forming a recirculating system in a swimming pool comprising a tank having side and end walls, and a filter system associated with said tank, said method comprising the steps of:

bending sheet metal to form a coping which includes a gutter back wall and bottom wall,

forming an elongated conduit-enclosing member having inner and outer longitudinal edges,

welding said two longitudinal edges of said conduit-enclosing member to said sheet metal along continuous longitudinal welds to form a liquid-tight conduit between the sheet metal and the elongated member, the outer of said longitudinal edges being spaced from said back wall so that said back wall, bottom wall and conduit-enclosing member form a return gutter,



transversely welding a plurality of said sheet metal and said conduit-enclosing members in abutting relation to provide a continuous conduit and gutter around the perimeter of said tank,

connecting said gutter to the inlet side of said filter,

connecting said conduit to the discharge side of said filter for the introduction of filtered water under pressure into said pool,

pressure testing said conduit while the welds forming it are exposed for repair, and

forming inlet openings in said conduit for directing water into said tank,

whereby substantially the entire welds forming said conduit are exposed for repair after said tank is constructed.

3,923,231

DIFFUSION BONDING OF GOLD TO GOLD

Edward Catalano, Pleasanton, and Donald L. Ornellas, Livermore, both of Calif., assignors to The United States of America as represented by the Energy Research and Development Administration, Washington, D.C.

Filed Apr. 11, 1975, Ser. No. 567,230

Int. Cl.² B23K *19/00*

U.S. Cl. 228—194 **5 Claims**

1. A process for diffusion bonding gold to gold comprising:

1. placing a mercury interlayer between two similarly surfaced gold pieces which are to be bonded together,

2. pressing together the two gold surfaces with the mercury interlayer between them,

3. while pressing the gold-mercury-gold assembly together, heating the assemly to a temperature of about 100°C, and

4. maintaining said assembly under pressure at said temperature for a period of time exceeding two days.

3,923,232

METHOD OF BONDING $RECO_5$ MAGNETS, APPARATUS FOR EFFECTING THE METHOD AND PERMANENT MAGNETS PRODUCED BY THE METHOD

Jaroslaw Houska, Niederrohrdrof, and Jan Strejcek, Turgi, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 20, 1974, Ser. No. 481,185

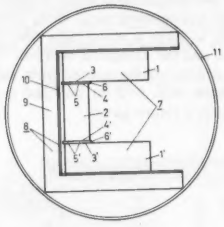
Claims priority, application Sweden, June 29, 1973, 739489

Int. Cl.² B23K *1/04*

U.S. Cl. 228—221 **10 Claims**

1. A method of braze bonding together at least two shaped permanent magnets wherein said shaped permanent magnets are formed of an alloy of the formula $RECo_5$ wherein RE is at

least one metal selected from the group consisting of rare-earth metals, alloys thereof and misch metal, which comprises: applying a solder foil of a thickness of 10μ to 50μ between the



surfaces of said shaped permanent magnets intended to be joined, and heating said assembly to a temperature sufficient to cause melting of said solder, wherein said heating is effected in a non-oxidizing atmosphere.

3,923,233

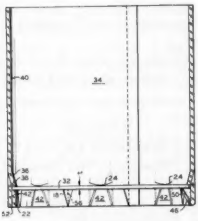
CONTAINER AND PAPERBOARD BLANKS FOR FORMING SAME

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 261,370, June 9, 1972, abandoned. This application Dec. 4, 1973, Ser. No. 421,507

Int. Cl.² B65D *3/14*

U.S. Cl. 229—5.5 **17 Claims**



1. A packaging container comprising:

a wall member having first and second overlapping end portions secured one to the other for forming a continuously curved container wall having a central axis, first and second edges, and first and second edge portions, said container wall having a plurality of spaced-apart cuts formed in said first edge portion of said container wall with a middle portion of each said cut being spaced a uniform distance from said first edge of said container wall, each said cut being of arcuate configuration with the ends of each said cut being located closer to said second edge of said container wall than said middle portion of each said cut, portions of the container wall adjacent said cuts toward said second edge of said container extending inwardly to a location spaced from said axis a distance less than the distance from said axis to the remainder of said container wall, said portions thereby forming a plurality of ledges along an inner surface of said container wall;

a bottom closure member having a continuously curved perimeter and being positioned at said first edge portion of said container wall in contact with said ledges for closing one end of said container, said perimeter of said bottom closure member being of substantially the same length as said first edge of said container wall; and

means for maintaining said bottom closure member in contact with said ledges.

3,923,234

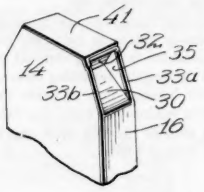
DOUBLE WEB CORNER CARTON

Raymond W. Lund, Jr., N.E. Blaine, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Apr. 11, 1975, Ser. No. 567,314

Int. Cl.² B65D *5/02*

U.S. Cl. 229—37 E **2 Claims**



1. In a blank for a carton having a pair of parallel face panels, said face panels having parallel vertical lateral edges and parallel horizontal top and bottom edges, and side walls foldably connecting adjacent lateral edges of said face panels, a corner structure, comprising:

a first fold line extending horizontally across a first of said side walls and spaced from the top end thereof;

first diagonal fold lines in each of said face panels extending upwardly from the ends of said first fold line in said first side wall and terminating along said top edges of said face panels;

a second horizontal fold line extending across said first side wall and positioned in vertical alignment with said top edges of said face panels, said first side wall extending vertically beyond said top edges of said face panels;

second diagonal fold lines extending upwardly from the ends of said second horizontal fold line;

first angular reinforcing panels positioned along each lateral edge of said first side wall and defined by the lateral edges of said side wall, said first and said second diagonal fold lines;

second angular reinforcing panels positioned along each lateral side of said first side wall and above said first angular panels, said second panels defined by the lateral edges of said first side wall and said second diagonal fold lines.

3,923,235

PROTECTIVE CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Feb. 19, 1975, Ser. No. 550,948

Int. Cl.² B65D *25/14, 5/58*

U.S. Cl. 229—39 B **5 Claims**

1. In a one-piece carton for shipping and storing fragile articles, said carton made from foldable paperboard or similar sheet-like material and having four side wall panels rectangularly arranged to form an elongated tube and having top and bottom sets of closure flaps for closing the ends of said carton, improved means within said carton for holding said fragile article, said improved means comprising the following:

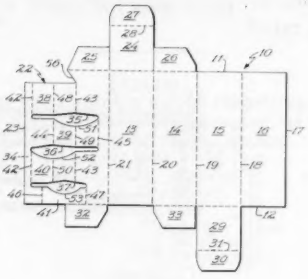
a cushioning section made from said material and extending between two opposite panels of said four side wall panels, said section extending substantially the length of said carton;

said cushioning section having an upper web member extending between said two opposite panels near one lateral side of said two panels;

said cushioning section also having a middle web member extending generally parallel to said upper web member but positioned below said upper web member and near the opposite lateral side of said two panels;

a lower web member beneath said middle web member and positioned in alignment with said upper web member;

a tube supporting fourth web positioned below said lower web member and extending between said two opposite panels near the center thereof;



said members and said fourth web connecting in said cushioning section to elongated glue sections connected adjacent to respective opposite lateral edges of said two opposite panels.

3,923,236

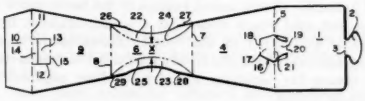
ARTICLE CARRIER

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 397,166, Sept. 14, 1973, Pat. No. 3,861,530. This application Oct. 21, 1974, Ser. No. 516,305

Int. Cl.² B65D *85/62, 21/00*

U.S. Cl. 229—40 **3 Claims**



1. An article carrier blank comprising a top panel, a locking tab foldably joined to one side edge of said top panel, a first side panel foldably joined to the opposite side edge of said top panel, holding tabs struck from said top panel and said first side panel respectively adjacent the fold line therebetween, said holding tabs being foldably joined to each other, a retaining strap foldably joined to the edge of said first side panel remote from said top panel, retaining flaps foldably joined to the side edges of said retaining strap, a second side panel foldably joined to the end of said retaining strap remote from said first side panel, a retaining tab struck from said second side wall remote from said retaining strap to define a locking aperture, said retaining tab being foldably joined along an edge of said locking aperture, and a lap panel foldably joined to said second side wall along an edge thereof remote from said retaining strap.

3,923,237

PACKAGE AND METHOD OF FORMING SAME

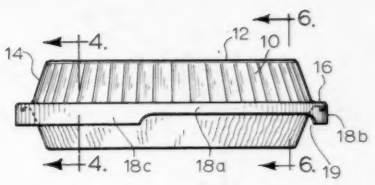
Donald J. Bostrom, Northbrook, and Stanley Moorad, Niles, both of Ill., assignors to Ekco Products, Inc., Wheeling, Ill.

Filed Aug. 6, 1974, Ser. No. 495,197

Int. Cl.² B65D *5/64, 43/08*

U.S. Cl. 229—43 **3 Claims**

1. A reclosable package comprising a circular pan having a bottom wall, a side wall extending upwardly and outwardly from said bottom wall, and a peripheral flange extending outwardly from the upper end of said side wall; a product in said pan; and a preformed circular dome cover of biaxially oriented thermoplastic material, said cover comprising a top wall, a side wall depending downwardly from said top wall, a peripheral shoulder extending outwardly from said side wall and a peripheral skirt depending downwardly from said shoulder, said shoulder overlying said pan flange, said skirt extending below said pan flange and having the periphery thereof



curled beneath said flange, said skirt comprising long portions and short portions whereby said long portions curl under said flange a substantial portion of the lateral dimension of the flange and said short portions curl just slightly under the flange, said short portions comprising less than one-half the total circumferential length of said skirt, and at least one long portion being liftable from securement with the pan flange.

3,923,238

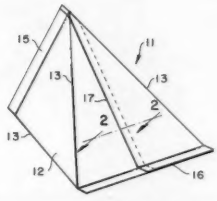
NON-WICKING CONTAINER

Manuel A. Thomas, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed May 22, 1974, Ser. No. 472,411

Int. Cl.² B65D *5/42*

U.S. Cl. 229—48 T **5 Claims**



1. A container comprising a paper unit with edges sealed to each other and edges located on the inside of the container coated with the reaction product of a vinyl polymer with reactive groups and a halo-metallic Werner type complex.

3,923,239

CIGARETTE CASE

Bong Gill Lee, 732-21 Hannam-Dong, Youngsan-ku, Seoul, South Korea

Filed Apr. 18, 1974, Ser. No. 461,851

Claims priority, application South Korea, May 22, 1973, 3075

Int. Cl.² B65D *5/54, 17/00*

U.S. Cl. 229—51 C **8 Claims**

1. A cigarette package comprising:

a. a top;

b. a front;

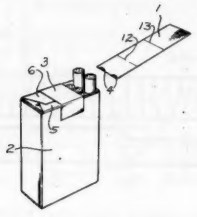
c. a back;

d. two sides;

e. folded top flaps connected to the front and back of the package having aligned intermediate transverse slots therein;

f. a tab, having a width dimension the same as the cigarette package, releasably adhering to the inside of a lateral side of the package and continuously extending below said

folded top flaps from said lateral side to the opening formed by the aligned slots in said folded top flaps and above said flaps from said opening back toward said lateral side; and



g. means for releasably attaching said tab to a cigarette; whereby pulling said tab in the direction of said lateral side opens the top of the package and draws the cigarette up through the open top.

3,923,240

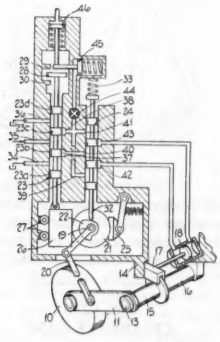
LAND VEHICLE WHEEL SUSPENSION ARRANGEMENT

Stanley George Glaze, Brierley Hill, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Aug. 26, 1974, Ser. No. 500,578

Int. Cl.² B60G *11/64*

U.S. Cl. 280—124 F **5 Claims**



1. A land vehicle wheel suspension arrangement for a wheel carrier displaceable in opposite directions from a datum position relative to a vehicle body, including a control device comprising first means sensitive to the direction in which the wheel carrier is displaced from said datum position relative to the body, second means sensitive to the direction in which the wheel carrier is moving relative to the body, a wheel carrier suspension, clutch means movable between a position stiffening said suspension and a position softening said suspension, and means actuable by said first and second direction sensitive means for operating the clutch means to stiffen the suspension when the directions sensed by both direction sensitive means are the same and operating the clutch to soften the suspension when said directions are opposite.

3,923,241

DECANTING CENTRIFUGE

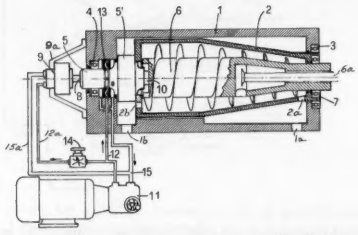
Ivan Jaroslav Cyphelly, Forchstrasse 968, Hinteregg, Switzerland (8128)

Filed July 18, 1974, Ser. No. 489,490

Claims priority, application Switzerland, July 21, 1973, 10690/73

Int. Cl.² B04B *1/20, 9/00*

U.S. Cl. 233—7 **6 Claims**



1. A decanting centrifuge for separating solids and liquids from a mixture comprising a drum supported for rotation about an axis, a worm mounted within said drum for roation about said axis, a main drive motor coupled to said drum means for driving said drum at a first rotational speed, and drive means for driving said worm at a second speed different from said first speed, said drive means comprising a hydraulic motor mounted coaxially with said drum and said worm, said hydraulic motor being connected to said main drive motor and rotated thereby and coupling said main drive motor to said drum, said hydraulic motor having a casing rigidly connected to said drum and a shaft rigidly connected to said worm so that said hydraulic motor casing rotates at the same speed as said drum and said worm rotates at a speed different from the speed of said drum by the speed differential between said casing and said shaft, and rotary transmission means engaging said casing for supplying a hydraulic drive medium to said hydraulic motor.

3,923,242

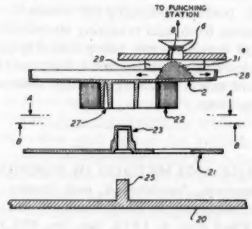
CHAD BOX

Edward Feldman, Teaneck, N.J., assignor to Litton Business Systems, Inc., Pinebrook, N.J.

Filed Mar. 31, 1975, Ser. No. 563,672

Int. Cl.² G06K *1/02*

U.S. Cl. 234—128 **9 Claims**

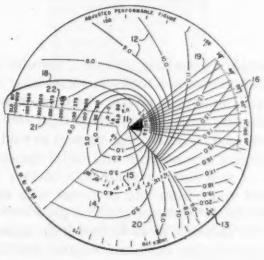


1. A tape punch apparatus having a punch mechanism for punching information into a tape feeding from a tape roll comprising:

a housing unit having an upper and lower section located above each other,

a drawer means located within said lower section,
said punch mechanism located in said upper section,
chad guiding means, connecting said upper section to said drawer means, for guiding chad generated by the operation of said punch mechanism into said drawer means, and
positioning means for locating a tape roll within said drawer.

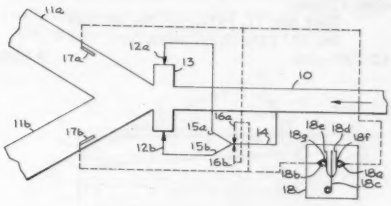
3,923,243
SHIP BOARD SONAR RANGE COMPUTER
Daniel Barron, 9326 Edmonston Road, Greenbelt, Md. 20770
Filed Sept. 22, 1972, Ser. No. 290,420
Int. Cl.² G06C 3/00
U.S. Cl. 235—88 R **2 Claims**



1. A range computer for computing the probable range of detection for a hull mounted sonar; which comprises,
a base plate,
said base plate including adjusted performance figures equally spaced about its outer edge and range curves over three guadrants thereof, with the remaining guadrant including temperature gradient values increasing in value clockwise and range curves related to said temperature gradient values,
a transparent surface layer temperature disc overlaying said base and rotatable about its center relative thereto,
said transparent temperature disc including thereon a surface water temperature scale and an index line related thereto,
a transparent, layer depth scale cursor overlaying said transparent temperature disc and rotatable about the center of said base plate
said temperature disc and said layer depth scale cursor cooperate with said adjusted performace figure scale to determine range in the first layer.

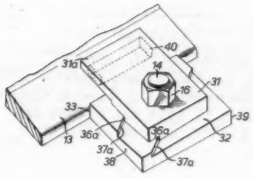
3,923,244
FLUIDIC APPARATUS FOR AIR-CONDITIONING SYSTEM
Gene W. Osheroff, 2813 Cameo Circle, Las Vegas, Nev. 89107
Continuation-in-part of Ser. No. 101,901, Dec. 28, 1970, Pat. No. 3,680,776, which is a continuation-in-part of Ser. No. 839,313, July 7, 1969, abandoned. This application July 28, 1972, Ser. No. 276,014. The portion of the term of this patent subsequent to Aug. 1, 1989, has been disclaimed.
Int. Cl.² F24F 7/00
U.S. Cl. 236—49 **46 Claims**

1. A method of conditioning the air in an open space comprising: providing a source of continuously flowing conditioned air under pressure; directing a plurality of pulses of said conditioned air from said source to said space; and varying the



duration of said pulses if the ambient air temperature of the space differs from a predetermined reference temperature.

3,923,245
RAIL CLIP ASSEMBLY
Ian McGregor Marchant, Ashtead, England, assignor to Kins Development Limited, England
Filed Mar. 8, 1974, Ser. No. 449,531
Claims priority, application United Kingdom, Mar. 9, 1973, 11617/73; Dec. 3, 1973, 55841/73
Int. Cl.² E01B 9/66
U.S. Cl. 238—347 **7 Claims**

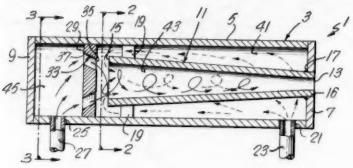


1. A clip assembly for use in securing a rail to rail support means comprising:
a first body;
a second body;
said first body being adapted to be assembled with said second body so as to overlie a portion of the rail and to overlie said second body with a surface of said first body contacting a surface of said second body;
said second body defining a lateral face for abutment with a lateral face of the rail;
means defining an aperture through each body, which apertures are arranged to be in register when said bodies are assembled for use in securing said bodies to the rail support means, said aperture in said second body being elongate to permit said bodies to assume different relative positions when assembled; the direction of elongation being inclined at an acute angle to the direction of extent of the rail,
each of said contacting surfaces including a laterally directed portion, which portions are abutted for transmitting forces applied by the rail to said second body to said first body, said laterally directed surface portions extending in the direction of elongation of said aperture in said second body so that said surface portions remain in abutment in said different relative positions fo said bodies;
said second body increasing in thickness in the direction of approach to said inclined laterally directed surface portions to said rail.

3,923,246
METHOD AND APPARATUS FOR USE IN MAKING SNOW

Oscar F. Cloutier, 500 rue Fillion, St. Jovite, and Charles P. Duncan, Mont-Tremblant Lodge, Mont-Tremblant, both of Quebec, Canada

Filed July 11, 1974, Ser. No. 487,649
Int. Cl.² F25C 3/04; B05B 7/10, 7/04
U.S. Cl. 239—2 S 9 Claims

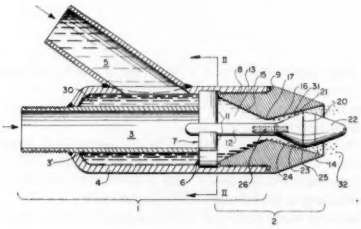


1. A method for use in making snow comprising:
forming a spiraling column of air and moving it in one direction to and through an unobstructed mixing chamber and out a nozzle,
flowing water in a direction substantially opposite to the one direction along the outside of the nozzle and chamber,
thereafter introducing said water into the spiraling column of air at a space adjacent the inlet to the mixing chamber, said space formed between said mixing chamber and the means used to form the spiraling column, said water being introduced substantially uniformly about the periphery of said spiraling column of air to thoroughly mix and disperse the water with the air in the mixing chamber.

3,923,247
SNOWMAKING DEVICE

Jeffery A. White, London, Canada, assignor to Command Engineering (International) Ltd., London, Canada

Filed July 15, 1974, Ser. No. 488,642
Int. Cl.² F25C 3/04; B05B 7/12, 1/32
U.S. Cl. 239—14 6 Claims

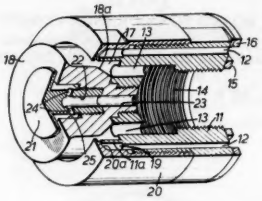


1. In a snowmaking device of the type comprising a gun section having an outer water discharge conduit, a coaxial inner air discharge conduit and a nozzle connected to the downstream end of said gun which is coaxial therewith, the improvement comprising a nozzle having an upstream conically converging collector section and a downstream conically diverging horn section, said inner air discharge conduit being larger than the smallest diameter of said conically converging collector section and directed coaxially at said collector section to effect a first acceleration and atomization of water entering said section, a circular restricter positioned internally of said horn section and coaxial therewith whereby the wall of said horn section and the radial extent of said restricter define an annular gap, the area of said annular gap being less than the area of the circular opening defined between the collector section and the horn section to effect a second acceleration and atomization of water particles.

3,923,248
LIQUID FUEL ATOMIZER

Alan Cresswell, Rochester, England, assignor to Decafix Limited, Rochester, England

Filed Oct. 25, 1974, Ser. No. 518,094
Claims priority, application United Kingdom, Oct. 26, 1973, 49871/73
Int. Cl.² B05B 15/02, 7/06, 1/26
U.S. Cl. 239—113 5 Claims

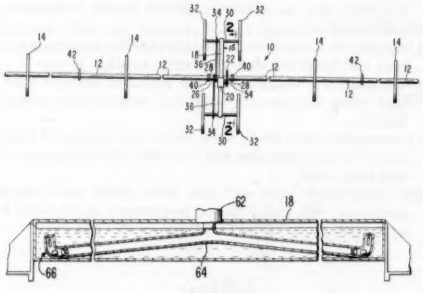


1. An atomizer comprising an outer, annular liquid nozzle chamber which converges towards an annular outlet therefrom, a coaxial, inner gas nozzle chamber which converges towards an annular outlet therefrom, a rigid annular deflector member positioned coaxially with respect to said outlet openings and extending at least from said outlet openings to a point downstream of said outlet openings, a further deflector arranged spaced apart from and coplanar with the outer end surface of the deflector member and a gas bleed duct formed in the deflector member so as to lead from a gas supply duct to the space between the deflector member and further deflector member.

3,923,249
MOBILE IRRIGATION SYSTEM

John A. Mortimer, San Jose, Calif., assignor to Shur-Rane Corporation, San Jose, Calif.

Filed Jan. 27, 1975, Ser. No. 544,171
Int. Cl.² B05B 3/02; B67D 5/08
U.S. Cl. 239—212 6 Claims

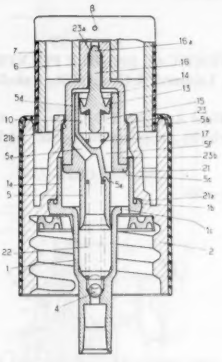


1. An improved, mobile irrigating system of the type having a plurality of wheel mounted irrigating pipes coupled in line to a central, internal combustion engine powered unit which turns the irrigating pipe wheels by turning the line of coupled pipes wherein the improvement comprises a sealed, hollow cross support structure for the central power unit, the hollow space of the cross support constituting a fuel tank for the engine, and indicator means mounted on selected ones of the wheels and aligned with each other to indicate the rotational orientations of the pipes about their longitudinal axes.

3,923,250
LIQUID PERFUME ATOMIZERS

Michel Boris, Paris, France, assignor to Societe Technique de Pulverisation, Paris, France

Filed Feb. 10, 1975, Ser. No. 548,881
Claims priority, application France, Feb. 8, 1974, 74.04939
Int. Cl.² B05B *9/04*
U.S. Cl. 239—321 **7 Claims**



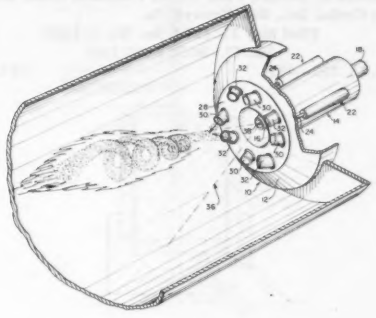
1. In an atomizer for perfumes and other liquids,
means defining a first cylinder forming a pump chamber,
a non-return valve,
a dip tube communicating with the first cylinder through the non-return valve, the dip tube being arranged to extend into the liquid to be atomized,
a hollow, first, piston slidable in the first cylinder,
an extension, of increased cross-section, to the first piston and defining a second cylinder,
a second piston slidable in the second cylinder,
an atomizing nozzle,
a valve controlling communication between the first cylinder and the atomizing nozzle, said second piston being connected to the valve, and
resilient means acting on the second piston and biasing the valve into a position in which communication from the first cylinder to the nozzle is interrupted.

3,923,251
OIL BURNER TURBULATOR END CONE, AND METHOD FOR GENERATING COUNTER-ROTATING AIR FLOW PATTERNS

Norman E. Flournoy, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 93,347, Nov. 27, 1970, abandoned. This application Dec. 1, 1972, Ser. No. 311,199
Int. Cl.² B05B *7/10;* **F23D** *11/16*
U.S. Cl. 239—402.5 **7 Claims**

1. In an oil burner comprising an elongated air blast tube having a central axis with opposed inlet and discharge ends, said tube being communicated with a source of pressurizing air, a fuel nozzle tip and ignition means in said tube to ignite an air-fuel mixture, the improvement in said oil burner which comprises;
a cap carried on the inlet end of said air blast tube, said cap being provided with orifice means comprising at least two pairs of closely spaced orifices, each orifice being communicated with a source of air, said at least two orifice pairs being spaced annularly from each other about said blast tube central axis,
each orifice opening in the respective orifice pairs having a longitudinal axis directed to form an angle with a plane passing normal to said blast tube central axis, the longitudinal axes of said respective orifice openings being further biased toward each other,
whereby adjacent streams of air issuing from adjacent orifice pairs are swirled in a common rotational direction to interact and mutually form a rotatably expanding, conically shaped air stream along said air blast tube, and flowing toward the discharge end of the latter,

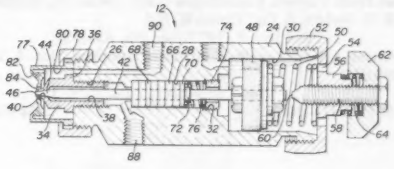


the respective swirling air streams from each orifice pair being spaced about said blast tube central axis to define therebetween an area of high turbulence and shear along the inner margin of the conically shaped air stream into which atomized fuel is introduced.

3,923,252
SPRAYING APPARATUS

Walter B. Warning, Sr., Chicago, and Walter B. Warning, Jr., Schaumbert, both of Ill., assignors to Automation Development and Engineering Corporation, Elk Grove Village, Ill.

Filed Dec. 9, 1974, Ser. No. 530,615
Int. Cl.² B05B *7/12*
U.S. Cl. 239—411 **7 Claims**



1. Apparatus for atomizing and spraying a liquid, comprising
a body member having a bore therein,
a tubular tip member mounted in one end of said bore and having a forewardly disposed liquid orifice defined by a conical valve seat,
a needle valve having a frusto-conical valve portion reciprocably mounted in said bore for movement of said valve portion into and out of sealing engagement with said valve seat,
spring means mounted in said bore urging said needle valve into sealing engagement with said valve seat,
fluid operated means mounted in said bore for moving said needle out of sealing engagement with said valve seat,
a plurality of sealing gaskets interposed between an intermediate portion of said needle and said bore for preventing fluid from traveling across said intermediate portion of said needle,
a plurality of bushings slidably disposed on said needle and spaced apart by a plurality of said gaskets for guiding said

needle for movement along the central longitudinal axis of said valve seat, and

passageway means for supplying said liquid to said bore forwardly of said sealing gaskets.

3,923,253

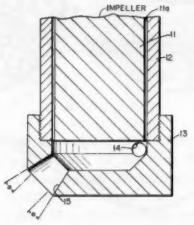
SPRAYING NOZZLE

Sherman A. Stewart, Palos Verdes Peninsula, Calif., assignor to Grefco, Inc., Bala Cynwyd, Pa.

Filed May 21, 1974, Ser. No. 471,881

Int. Cl.² B05B *1/34, 1/00*

U.S. Cl. 239—463 10 Claims



1. A fluid spray nozzle comprising:

a. spray fluid inlet means;

b. pressurized gas inlet means;

c. a chamber for receiving spray fluid from said spray fluid inlet means and pressurized gas from said pressurized gas inlet means; and

d. fluid outlet spray means having an unimpeded open channel connected to said chamber and directed at an angle away from the chamber, said spray means including an outlet orifice having a circular opening at one end thereof and an ellipsoidal opening at the other end thereof.

3,923,254

CEMENT MILL AND METHOD OF STARTING SAME

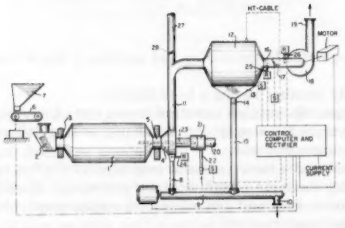
Poul Frede Carlsen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Dec. 4, 1973, Ser. No. 421,531

Claims priority, application United Kingdom, Dec. 4, 1972, 55901/72

Int. Cl.² B02C *21/00*

U.S. Cl. 241—30 32 Claims



1. A method of operating a grinding plant having a grinding mill with means for introducing cooling water into the mill, means for providing a controlled ventilating air supply into the mill for ventilating the mill, an electrostatic precipitator means for removing dust from the air exiting from the mill, the improvement which comprises starting said grinding mill while simultaneously maintaining said ventilating air supply at a minimum level until the temperature of the ground product of the mill is increased to a predetermined level requiring the introduction of cooling water to maintain the temperature of the ground product at least at said predetermined level, activating the flow of cooling water into the mill when said predetermined temperature level of said ground product is reached, providing temperature sensing means to measure the temperature of the ground product of the mill, and controlling said ventilating air supply in direct dependence upon the flow of cooling water into said mill such that the temperature levels of the mill are thereby controlled by the air flow and the water introduced therein.

3,923,255

VERTICAL SPINDLE PULVERISERS

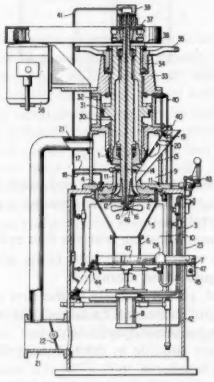
Keith W. G. Leonard, 4 Geneva St., Lakefield, Benoni, South Africa

Filed Apr. 30, 1974, Ser. No. 465,592

Claims priority, application South Africa, July 3, 1973, 73/4492

Int. Cl.² B02C *7/08*

U.S. Cl. 241—56 7 Claims



1. A vertical spindle pulverizer comprising a housing structure;

a spindle vertically and rotatably mounted in the structure;

means for rotating the spindle;

a first grinding disc secured to the spindle near the lower end thereof;

a second complementary grinding disc fixed in the structure above said grinding disc and with the spindle passing through a central aperture therein;

a compartment in the structure about and below said discs;

a removable receptacle located in the structure below said discs and in said compartment;

a feed hopper communicating with a space between the discs;

the pulverizer being characterized in that it includes means for supplying air under pressure automatically to sweep the interior of the pulverizer, said means comprising:

an axial central bore through said spindle;

at least one radial outlet through the spindle from said bore which emerges facing said second grinding disc;

at least one radial outlet through the lower end of said spindle below said first disc;

a source of compressed air connected to said axial central bore in the spindle;

a valve controlling the supply of compressed air to said axial central bore, the valve being in cooperative relationship with said receptacle such that removal of the latter automatically opens the valve and replacement of said receptacle automatically closes the valve.

3,923,256
APPARATUS FOR TREATING OLD TIRES

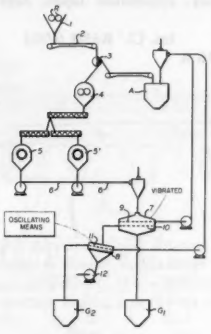
Harald P. Dörner, Salach, Germany, assignor to Allgaier-Werke GmbH, Uhingen, Germany

Filed Jan. 9, 1974, Ser. No. 431,914

Claims priority, application Germany, Jan. 17, 1973, 2302120

Int. Cl.² B02C *23/14*

U.S. Cl. 241—76 **1 Claim**



1. An apparatus for treating old rubber tires having carcasses of fiber material and steel, comprising:
- a first comminuting device for breaking up said tires into pieces;
- magnetic separator means for removing from the pieces produced by said device, those pieces containing steel;
- a first mill for comminuting the pieces passing said magnetic separator means and producing a coarse product;
- an attrition mill connected to said first mill for comminuting said coarse product and producing a fine product and releasing said fibers from the rubber; and
- means for separating said fine product into a first component consisting predominantly of said fibers and a second component substantially free from fibers and constituting a rubber granulate, said separating means including:
- at least one horizontal vibrating-sieve screening device having at least two horizontal sieve decks lying one above another,
- means for removing above the upper one of said decks at least part of said first component, means for removing a rubber granulate from below the upper one of said decks, and
- a sorting device receiving the rubber granulate removed from below the upper deck, said sorting device having
  - a perforated surface inclined slightly to the horizontal and adapted to receive the rubber granulate removed from below said upper deck,
  - means for oscillating said perforated surface, and
  - means for passing a fluidizing gas stream upwardly through said perforated surface at a intensity related to the oscillation of said surface and sufficient to cause rubber particles to ascend on said surface and fiber particles to move in the opposite direction to said rubber particles.

3,923,257
DEVICE FOR EXTRACTING AND SHREDDING FODDER

Walter Reber, Saverne, France, assignor to Kuhn S.A., Saverne, France

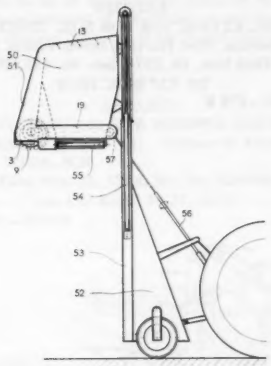
Filed Apr. 2, 1974, Ser. No. 457,242

Claims priority, application France, Apr. 6, 1973, 73.13605; Mar. 5, 1974, 74.08090

Int. Cl.² B02C *19/00*

U.S. Cl. 241—101.7 **27 Claims**

1. A device for extracting and shredding fodder stored in a silo extending along the ground, comprising a vehicle, cutting and shredding means mounted on the front of the vehicle, means for moving said cutting and shredding means bodily upwardly and downwardly together as a unit relative to the vehicle, the shredding means comprising a rotor mounted for



rotation about a horizontal axis transverse to the path of movement of the vehicle, at least a portion of said cutting means being downwardly directed and extending below said axis of rotation and being disposed in front of said rotor.

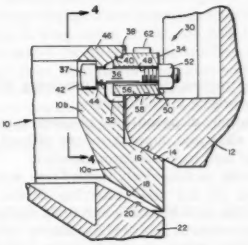
3,923,258
UPPER LINER SECUREMENT FOR A GYRATORY CRUSHER

Charles M. Hendrickson, Vancouver, Wash., assignor to Columbia Steel Casting Co., Portland, Oreg.

Filed May 22, 1974, Ser. No. 472,127

Int. Cl.² B02C *2/04*

U.S. Cl. 241—207 **6 Claims**



1. In a gyratory crusher of the kind in which an upper liner support has an inclined lower surface and an upper liner has an inclined outer surface shaped complementary to and engageable with said surface of the liner support, the improvement comprising,
- liner securement means for pulling said liner surface up into tight engagement with said liner support surface,
- said liner securement means including pockets in the liner and coacting wedge blocks and bolts for pulling each wedge block into a related liner pocket,
- each pocket having internal wall structure which includes a generally flat upper wedge surface and two parallel, laterally spaced sidewalls, and
- each wedge block including a generally flat upper wedge surface shaped complementary to and engageable with the upper wedge surface in a related pocket and two flat sides engageable with the side walls in a related pocket so that each wedge block provides lift and anti-rotation

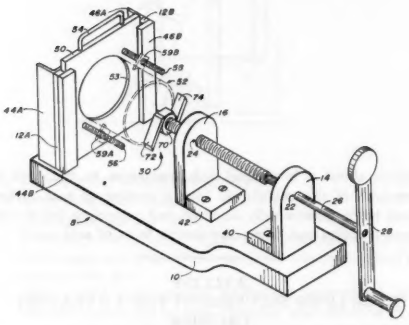
shear forces in a related pocket on two axes which are in true perpendicular to each other within the pocket.

3,923,259

SOIL EXTRACTOR FOR SOIL TESTING

Russell P. Gorsha, 4040 Fairview Drive, Toledo, Ohio 43612

Filed Mar. 28, 1974, Ser. No. 455,680
Int. Cl.² B02C 18/14
U.S. Cl. 241—278 R 3 Claims



1. A soil extracting device for removing soil from a soil container comprising in combination:

a. a horizontally disposed base platform member;

b. vertical slide and support means affixed to the upper surface of said base platform member;

c. a removable rectangularly shaped tray member which is positioned on the soil extracting device between the vertical slide members in a vertically upright position;

d. fastening means on said tray member to securely hold the soil container in a horizontial position on said tray member when the tray member is vertically upright between the vertical slide and support means;

e. vertical disposed support means located on the upper surface of the said base platform member, said vertical support means adopted to carry a shaft member at some height above the upper surface the base platform member which is sufficient to reach the center of the soil container;

f. a horizontally disposed rotatable shaft member carried by said vertical support means at a height above the top surface of the base platform member such that the central longitudinal axis of the shaft member reaches the center of the soil container when disposed in a horizontal position;

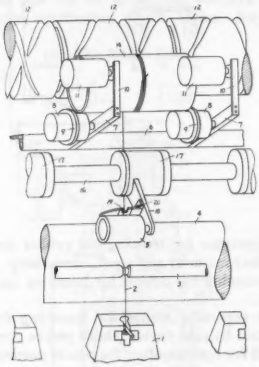
g. rotatable cutting means located on the end of the rotable shaft member which is adjacent to the vertical slide members, said cutting tool, said cutting means adapted to cut into any soil in the container to remove the soil upon rotation of rotatable shaft.

3,923,260

APPARATUS FOR DOFFING WITHOUT INTERRUPTING SPINNING OPERATION IN AN OPEN END SPINNING MACHINE

Waichi Sakurai; Katsunori Sato; Tomoyuki Miyagawa, and Hisateru Takahashi, all of Fukui, Japan, assignors to Daiwa Boseki Kabushiki Kaisha, Osaka and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, both of, Japan

Filed Aug. 13, 1974, Ser. No. 497,133
Claims priority, application Japan, Sept. 14, 1973, 48-104434
Int. Cl.² B65H 67/04
U.S. Cl. 242—18 A 2 Claims



1. A device for doffing a wound bobbin without interrupting the spinning operation in an open end spinning machine of the type including a frame, a plurality of spinning units arranged in side-by-side relation at a predetermined interval, each said spinning unit having a withdrawing roller for withdrawing a spun yarn from the spinning unit, and a split drum for traversing the withdrawn spun yarn for winding it on a bobbin; said device comprising:

a plurality of arms arranged along the machine frame at said interval, each of said arms being located between said withdrawing roller and said split drum and extending forwardly of said machine frame;

an empty bobbin supporting roller rotatably mounted on an intermediate portion of each of said arms;

a plate spring secured to a free forward end of each of said arms;

an empty bobbin pressing roller rotatably mounted on each of said plate springs;

each said supporting roller and respective pressing roller being located so as to define a separate empty bobbin receiving space in cooperation with said split drum;

each said plate spring comprising means to resiliently urge said respective pressing roller in a direction in which an empty bobbin is pressed against said split drum by means of said pressing roller when such empty bobbin is placed in said respective empty bobbin receiving space;

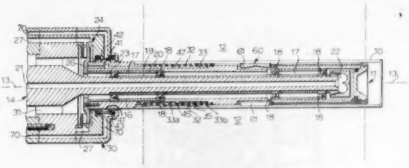
each said empty bobbin supporting roller and said respective empty bobbin pressing roller being arranged so that they respectively straddle the adjacent end portions of two adjacent empty bobbins when such bobbins are placed in respective adjacent empty bobbin receiving spaces; and

each said empty bobbin supporting roller having a flange at an intermediate portion thereof, said flange comprising positioning means common to said adjacent end portions of said two adjacent empty bobbins.

3,923,261
SPINDLE FOR A WINDING MACHINE

Bernard Isoard, and Jacques Morf, both of Ecully, France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed May 16, 1974, Ser. No. 470,447
Claims priority, application France, May 18, 1973, 73.18440
Int. Cl.² B65H 75/30, 79/00
U.S. Cl. 242—46.2 13 Claims



1. A spindle for supporting and rotating a tube around which strand material is wound, comprising:

a central portion extending in axial alignment with the tube, said central portion having a periphery with at least one recess therein;

a radially retractable sleeve surrounding said recess and disposed about said central portion;

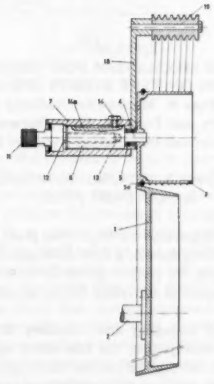
a bearing surface on said radially retractable sleeve for engaging the inner surface of the tube in non-slip relationship when the sleeve is not retracted; and

means for applying a vacuum to said recess to retract said sleeve radially and thereby disengage said bearing surface from non-slip engagement with the tube so the tube may be removed from the spindle.

3,923,262
YARN PULLING DEVICE

Gerardus Hendrikus Kaalverink, Asten, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Dec. 20, 1973, Ser. No. 426,441
Claims priority, application Netherlands, Dec. 22, 1972, 7217616
Int. Cl.² B65H 51/20
U.S. Cl. 242—47.01 6 Claims



1. A yarn pulling device comprising a cylindrical wrapping roller which is adapted to receive the yarn from a yarn supply and which has a rim by which the roller can be frictionally driven,

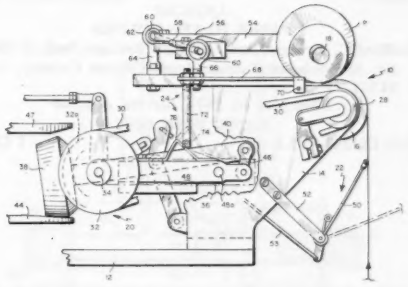
a mounting on which said roller is rotatably supported in an axially adjustable position,

and a driving disc rotatable about a fixed axis and having a surface which is symmetrical about said axis, said surface being non-parallel to said axis and frictionally engaging said rim in all of the adjusted positions of said roller, whereby adjustment of the contact of said rim along said surface changes the speed at which said roller is driven by the disc.

3,923,263
END FINDING AIR FOR WINDING MACHINE

Samuel L. Abbott, Wilton, N.H., assignor to Abbott Machine Co., Inc., Wilton, N.H.

Filed Nov. 25, 1974, Ser. No. 526,959
Int. Cl.² B65H 54/22, 63/02
U.S. Cl. 242—35.6 R 8 Claims



1. In a winding machine, a driving drum, a spindle, means supporting the spindle for rotation about an axis in driving engagement with the driving drum and for pivotal movement about an axis spaced from its axis of rotation to permit the spindle to be moved relative to the driving drum as the diameter of the package changes, said support means being movable relative to the driving drum to tilt the axis of the spindle relative to the axis of the driving drum and hence to move one of the package away from the driving drum without disengaging the other end therefrom, a yarn detector and means operative by the yarn detector upon detection of a broken yarn to effect movement of the support means to move said one end of the package away from the driving drum.

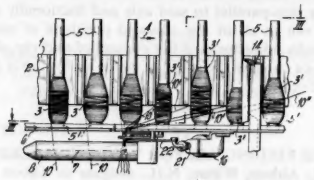
3,923,264
DEVICE FOR MAKING-READY THE UNWINDING OPERATION OF COPS

Willi Küpper, Rickelrath, Germany, assignor to W. Schlafhorst & Co. Maschinenfabrik, Rickelrath, Germany

Filed Nov. 12, 1973, Ser. No. 414,709
Claims priority, application Germany, Nov. 14, 1972, 2255645
Int. Cl.² B65H 54/22
U.S. Cl. 242—35.6 E 5 Claims

1. Device for making-ready the unwinding process of cops comprising a pair of counter-rotating cylinders disposed parallel to one another along a common contact line, conveyor means for moving a series of substantially vertically disposed cops having respective previously loosened thread ends on a path parallel to said cylinders and along said contact line thereof so that the thread ends are seizable by said cylinders at said common contact line thereof and withdrawable from the cops as the latter are moved along said path by said conveyor means; a transport plate located adjacent said conveyor means and having a plurality of teeth disposed in a plane transverse to the path of movement of the cops, and means for moving said transport plate and said plurality of teeth thereof

in a direction transverse to the path of movement of the cops in synchronism with said movement of the cops by said conveyor means for picking up successive thread ends of the series of cops and moving them in a step by step manner transversely to the path of movement of the cops.

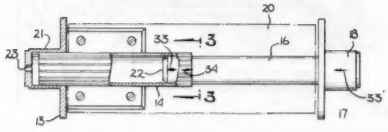


3,923,265

PAPER TOWEL HOLDER

Klifford C. Krueger, and Lucile M. Krueger, both of 20401 No. 357 Soledad Canyon Road, Canyon Country, Calif. 91351

Filed May 10, 1974, Ser. No. 468,740
Int. Cl.² B65H *19/00*
U.S. Cl. 242—55.2 **1 Claim**



1. A holder for rolls of paper material comprising:
a mount having a disc portion cantilevered outwardly from and normal to a support plate;
an elongated, hollow spindle having one end thereof secured to said disc portion and cantilevered therefrom normal to the inner surface of said disc portion;
a closure assembly for retaining the roll on said spindle including an elongated rod slidably engageable within the hollow of said spindle;
a second disc portion carried on the end of said rod, the opposing surfaces of said disc portions defining a retaining means for holding said roll of paper therebetween;
said spindle hollow and said rod being of out-of-round so as to bind for releasably locking said roll of paper onto said spindle;
said rod having a length of greater dimension than the dimensional length of said spindle so that rolls of varying length may be accommodated between said discs;
means for storing the extended portion of said rod beyond the length of said spindle when a roll having a length shorter than said spindle is used;
including indexing means for registering said rod with spindle so as to permit axial movement therebetween; and
handle means carried on said support member and on said mounting means.

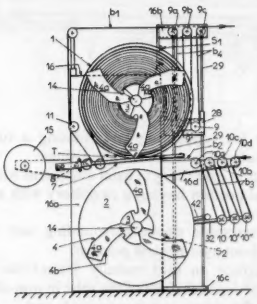
3,923,266

ENDLESS FILM WINDING OR UNWINDING DEVICE

Jean Paul Boyer, Impasse Melies, 30 Redessan, France

Filed Dec. 12, 1973, Ser. No. 423,976
Claims priority, application France, Dec. 12, 1972, 72.47176
Int. Cl.² G03B *21/00*
U.S. Cl. 242—55.16 **45 Claims**

1. Apparatus for the continuous winding and unwinding of an endless band through a utilization device, said apparatus comprising a first rotatable supply reel and a second rotatable take-up reel, each of said reels having a hub reversible drive means for said reels, means arraying said reels with respect to the utilization device such that two lengths of the band are wound in superposition on both reels and extend between both reels and the utilization device, one length on said second reel extending to the first reel, the other length on said second reel extending to said utilization device and traversing the same, said first reel receiving the length of the band issuing from the utilization device, said band forming a closed travel loop between said reels and the utilization device, one of said reels being external thereof; and feed means for placing against the second reel the length of band extending between the utilization device and said first reel when said second reel is empty whereby by reversing the direction of rotation of the reels the first reel can now become the take-up reel and the second reel the supply reel, said feed means including a feed arm pivotably mounted between said reels and engagement means on said feed arm for engaging the band to place the same against said second reel when the latter is empty.



3,923,267

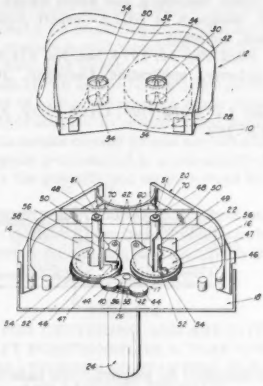
RIBBON FEED MECHANISM FOR FEEDING TYPE RIBBON ON TYPE RIBBON SPOOLS

Steve S. Eckerd; Ivan N. Markowitz; Anthony F. Maggio, all of Oklahoma City, and Darby A. Gray, Norman, all of Okla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 3, 1974, Ser. No. 475,550
Int. Cl.² B65H *17/02*
U.S. Cl. 242—67.4 **5 Claims**

1. In a printing apparatus having a base plate, a type ribbon wound on type ribbon spools, a first drive spool and a second drive spool engaging the ribbon spools for winding the ribbon from one ribbon spool to the other ribbon spool, the improvement comprising:
drive means for engaging and rotatably driving the first drive spool, disengaging the first drive spool, engaging and rotatably driving the second drive spool;
an electric motor having a motor shaft rotatably driving said drive means; and
an electrical contact board disposed between the base plate and the first and second drive spools, and electrically connected to said motor, said electrical contact board in contact with the first drive spool and the second drive

spool for producing an electrical signal when the ribbon on the ribbon spool is unwound so that the direction of



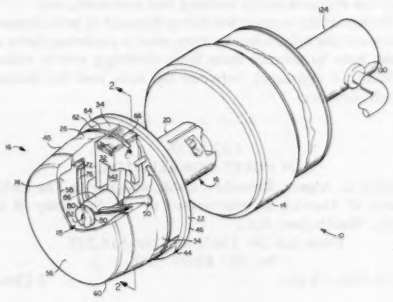
rotation of the motor shaft is reversed, thereby reversing the direction of rotation of said drive means.

3,923,268

AUTOMATIC REEL HUB ASSEMBLY

James P. Urynowicz, Los Angeles, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 15, 1974, Ser. No. 470,127
Int. Cl.² B65H *17/02*
U.S. Cl. 242—68.3 **23 Claims**



1. A reel hub assembly comprising:

an actuator shaft which is axially movable relative to a radially disposed shoe between a reel lock position and a reel release position, the actuator shaft being adapted at one axial position therealong to receive at least one drive link end in a mating relationship which prevents axial motion of the shaft relative to a mated end of a drive link while permitting radial motion of an end opposite the mated end of a drive link with respect to the shaft;

at least one drive link having opposed ends disposed to extend generally radially with respect to the actuator shaft with one end in a mating relationship with the actuator shaft at the one axial position and an opposite end in a mating relationship with a shoe, both said one and opposite end mating relationships permitting radial motion of the drive link relative to the mate while preventing axial motion of the drive link relative to the mate;

at least one shoe adapted to receive an opposite end of a drive link in a mating relationship which permits radial but not axial motion of said opposite end relative to the shoe; and

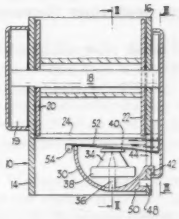
an actuator mechanism connected to cause relative axial motion of the shoe and actuator shaft between a reel lock axial position relationship and a reel release axial position relationship to move the shoe between a radially extended position and a radially retracted position respectively.

3,923,269

INERTIA REELS FOR VEHICLE SAFETY BELTS

John Kell, Carlisle, England, assignor to Kangol Magnet Limited, London, England

Division of Ser. No. 180,753, Sept. 15, 1971, abandoned. This application Apr. 15, 1974, Ser. No. 461,125
Claims priority, application United Kingdom, Nov. 6, 1970, 52966/70
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.4 **10 Claims**



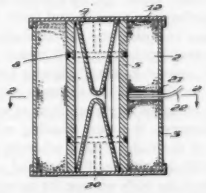
1. A reel device comprising a rotatable reel from which a belt can be unwound against the tension of a rewind spring, a pendulum, an upwardly extending mounting member for the pendulum, the mounting member terminating upwardly in an upstanding free end and the pendulum having a downwardly opening recess receiving the free end, the surface of the downwardly opening recess resting on the free end of the mounting member whereby the pendulum is pendulously mounted by the mounting member, a locking mechanism actuable to lock the reel against rotation in the belt unwinding direction, and means responsive to the tilting of the pendulum through a predetermined angle to actuate said locking mechanism.

3,923,270

PACKAGE OF FLEXIBLE MATERIAL WITH RADIAL OPENING EXTENDING INTO A CENTRAL AXIAL OPENING AND MEANS FOR PREVENTING INWARD COLLAPSE

James W. Newman, Scarsdale, N.Y.; Nicholas M. Bavaro, Hollywood, Fla., and Ronald E. Zajac, Yonkers, N.Y., assignors to Windings, Inc., Goldens Bridge, N.Y.

Continuation-in-part of Ser. No. 295,797, Oct. 10, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 507,609
Int. Cl.² B65H *55/02*
U.S. Cl. 242—163 **3 Claims**



1. A package of flexible material of the universal type having a central axial opening and a radial opening extending into

said axial opening through which the inner end of the material is led out, and having an enclosing casing, tapering members supported by said casing and extending into the axial opening from the ends of said package, a solid material filling at least the outer area of the axial space around said tapering members, said tapering members holding the filling material against the inner surface of the flexible material to prevent collapse thereof, said solid material comprising a plurality of blocks, each block extending from end to end of the axial opening and having ends engaging between said tapering members and the inner surface of the flexible material.

3,923,271

TAPE WINDING CONTROL FOR MAGNETIC TAPE CASSETTES

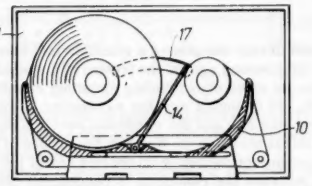
Albert Pertzsch; Jose Toral; Gottfried Lutz; Werner Wilke, and Anton Riedel, all of AGFA-Gevaert Aktiengesellschaft, Munich, Germany

Filed May 28, 1974, Ser. No. 473,390

Claims priority, application Germany, June 1, 1973, 2327844

Int. Cl.² G03B *1/04*; G11B *15/32*, *23/04*

U.S. Cl. 242—199 **8 Claims**



1. A tape-winding control for a magnetic tape cassette, having a head compartment containing a pair of tape rolls and connecting guide means disposed adjacent the base of the cassette which direct a substantially straight run of tape from one of the rolls to the other adjacent the base, comprising track means within the head compartment disposed substantially parallel to the base and spaced therefrom between the largest diameter of the rolls and the base, a substantially rigid one-piece bow-shaped member having a substantially straight midportion and a pair of arcuate ends, the curvature of the arcuate ends being large enough to receive the largest diameter of the rolls within them, the tip section of the arcuate ends engaging and guiding the tape to and from the rolls, movable connecting means coupling the substantially straight midportion of the bow member to the track means whereby the bow member may be caused to longitudinally slide back and forth along the track means, and the distance between the arcuate ends of the bow member being equal to at least the sum of the axial interval between the two winding rolls and twice the average radius of the rolls of tape whereby the bow member is caused to shift longitudinally parallel relative to a line through the axis of the rolls of tape for moving the tip sections of the bow member adjacent the periphery of the rolls to smoothly guide the tape on and off the rolls as their diameters vary.

3,923,272

MAGNETIC TAPE CASSETTE

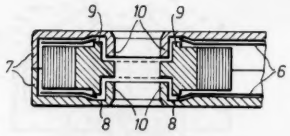
Albert Pertzsch; Jose Toral; Gottfried Lutz, all of Munich; Werner Wilke, Starnberg, and Anton Riedel, Neuried, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 31, 1974, Ser. No. 474,869

Claims priority, application Germany, June 1, 1973, 2327828

Int. Cl.² G03B *1/04*; G11B *15/32*, *23/04*

U.S. Cl. 242—199 **7 Claims**



1. A pack assembly for magnetic tape cassettes, in particular compact cassettes having housing half members, centering rings in the housing half members, flangeless hubs, said flangeless hubs being mounted on the centering rings and apertured resilient support foils being concentrically arranged between the flangeless hubs and the housing half members, said assembly also comprising

a. the housing half members being annularly recessed laterally between the centering rings and an area partly covered by the flangeless hubs

b. the flangeless hubs having a ring-shaped torus on the front surface adjacent the centering ring

c. the resilient support foil being provided with an annular array of segmental cutouts and remaining fins in the area of the recesses in the housing half members, and

d. the fins of the support foil being disposed at an inclination toward the hubs whereby they exert a centering force on the hubs to prevent them from wobbling and to reduce frictional resistance between the hubs and the housing half members.

3,923,273

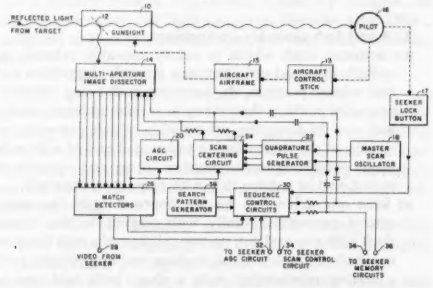
AIM POINT CORRELATOR

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1967, Ser. No. 614,527

Int. Cl.² F41G *7/00*

U.S. Cl. 244—3.16 **2 Claims**



1. For use in an electro-optical guidance system an aim point correlator comprising:

a. a gunsight having cross-hairs for aligning a missile carrying aircraft on a target of interest,

b. a multi-aperture image dissector,

c. a partially silvered mirror positioned in said gunsight for reflecting the image viewed by said gunsight on to said multi-aperture image dissector,

d. circular scan circuit means coupled to said multi-aperture image dissector for producing a circular scan of the target image to produce output signals proportional to the light reflected from said target,

e. comparison circuit means having a first input coupled to the output of said multi-aperture image dissector and a second input adapted to receive video signals from the seeker of a missile carried by said aircraft and producing output signals proportional to a mis-match of the target viewed by the gunsight and target viewed by the missile seeker,

f. control circuit means coupled to said comparison circuit means for producing error signals which can be fed to the seeker circuits for aligning the seeker with the gunsight.

3,923,274
DEVICE FOR CENTERING AND ARRESTING AN AIRCRAFT POSITIONED ON A TAKE-OFF AND LANDING PLATFORM AND STARTING THEREFROM AND LANDING THEREON

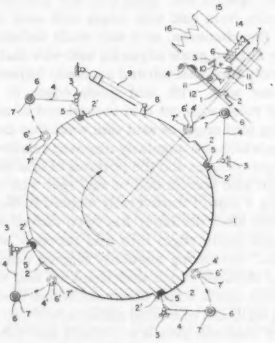
Helmut Stocklin, Markdorf, and Werner Keck, Friedrichshafen, both of Germany, assignors to Dornier GmbH, Friedrichshafen, Germany

Filed Dec. 18, 1974, Ser. No. 534,062

Claims priority, application Germany, Mar. 7, 1974, 2410818

Int. Cl.² B64F *1/12*

U.S. Cl. 244—115 **4 Claims**



1. A device for centering and arresting an aircraft positioned on a take-off and landing platform or starting therefrom and landing thereon, particularly a captive aircraft having a rotor and a landing ring, comprising platform means and rotatable displacing ring means,

means for rotating said displacing ring means,

vertically-displaceable and spring-suspended gripper means distributed at the circumference of said platform means and said displacing ring means, said gripper means being pivotal about centering and locking means,

means for running said gripper means against an aircraft landing ring after the aircraft has landed on said platform means, thereby pushing the aircraft into a centered position, at which time the aircraft is brought into the arrested position thereof by rotation about its vertical axis,

and means for vertically displacing said gripper means, whereby said aircraft is pulled against said platform means.

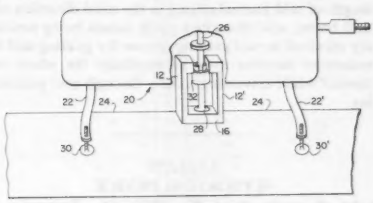
3,923,275
EJECTOR FOOT RESTRAINER FOR BOMB EJECTOR UNIT

John B. Dexter, California, and Robert C. Mann, Lexington Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 27, 1974, Ser. No. 527,665

Int. Cl.² B64D *1/06*

U.S. Cl. 244—137 R **3 Claims**



1. An ejector-foot restrainer, for use with an aircraft ejector-foot unit having a driving foot, a shaft connected thereto and a collar around said shaft, comprising:

a substantially U-shaped member having a shoulder extending inwardly from each of its upstanding sides, the shoulders being supportable by the collar on the shaft of the ejector-foot unit,

the base of the U-shaped member extending below the driving foot of the ejector-foot unit so the driving foot rests in contact with the upper surface of said base, and the spatial position of the U-shaped member being fixed relative to the driving foot so that they move in concert with each other.

3,923,276
LONGITUDINALLY ADJUSTABLE DRILL BOOM

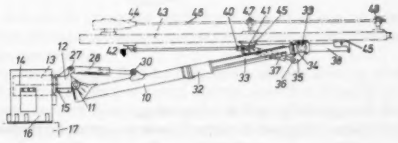
Erich Voldemar Kimber, Vendelso, Sweden, assignor to Atlas Copco AB, Nacka, Sweden

Filed June 18, 1974, Ser. No. 480,517

Claims priority, application Sweden, July 3, 1973, 7309932

Int. Cl.² E21C *11/00*; B66C *23/00*; E21C *11/00*

U.S. Cl. 248—16 **34 Claims**



1. A longitudinally adjustable drill boom adapted for positioning an elongated rock drilling apparatus to different alternative drilling positions with respect to a work surface, comprising in combination therewith:

a drill boom,

a boom support,

pivot means on said boom support for pivotally journalling one end of said drill boom to said boom support, said one end being the inner end thereof,

a journal casing arranged at the opposite outer end of said drill boom,

an adjusting head,

a boom extension member longitudinally slidable in said journal casing and carrying said adjusting head at the outer end thereof remote from said drill boom, said rock drilling apparatus being adjustably supported on said adjusting head,

a power cylinder connected to said boom extension member for adjusting the overall length of said drill boom and boom extension member between said boom support and said adjusting head,

an axial guiding groove in said journal casing, and

elongated guide means extending along said boom extension member and attached at one end to said boom extension member, the opposite end of said elongated guide means being slidably supported relative to said boom extension member in the longitudinal direction thereof, the length of said elongated guide means exceeding the length of said journal casing in the axial direction of said drill boom, said elongated guide means being non-turnably received in said guiding groove for guiding said boom extension member over substantially the whole length thereof while traversing axially through said journal casing.

3,923,277

SUPPORTING DEVICE

Frederick Perrault, 2644 W. 225th St., Torrance, Calif. 90505, and Raymond E. Perrault, 23441 Batey Ave., Harbor City, Calif. 90710

Filed Feb. 25, 1974, Ser. No. 445,537

Int. Cl.[2] F16L *3/00*

U.S. Cl. 248—49 16 Claims

1. A supporting device comprising

a bracket adapted for attachment to a structural element, said bracket including

a first portion,

a second portion at an angle to said first portion,

each of said first and second portions including a central portion and a flange at either side edge of said central portion,

said flanges extending from the same side of said central portion, and,

a third portion interconnecting said first and second portions, said third portion including rib means extending between said first and second portions,

said rib means including two spaced ribs positioned one at either side of said bracket,

a portion of said rib means forming a continuation of said flanges of said first and second portions,

said central portions of said first and second portions having adjacent ends lying spaced from each other to define an opening through said third portion intermediate and extending to said ribs.

3,923,278

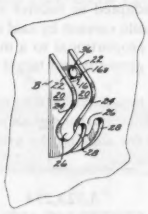
WALL HOOK STRUCTURE AND METHOD OF FORMING SAME

Paul M. Marcil, 12117 Phillips Ave., Lynwood, Calif. 90262

Filed July 15, 1974, Ser. No. 488,588

Int. Cl.[2] A47F *5/00*

U.S. Cl. 248—301 1 Claim



1. A one-piece wall hook structure that may be mounted in a non-pivoting position on a wall by a nail having a shank and head, which when so mounted will support a picture having a transverse wire affixed to the rear thereof, only when said wire is disposed in recessed portions of said wall hook structure, said wall hook structure comprising:

a. an initially flat sheet of a permanently deformable material of such shape that after deformation said sheet defines an elongate, rectangular rear wall having first and second ends and parallel, laterally spaced side edges, a rectangular tab that extends forwardly from said first end and slopes downwardly towards said second end, and two laterally spaced side walls that are parallel and extend outwardly from said side edges with said tab being disposed therebetween, said side walls defining two transversely aligned guide edges for said wire that are disposed outwardly from said tab and angularly disposed relative to said rear wall, with said guide edges in the portions thereof most adjacent said second end of said back wall merging into edges of said side walls that define recesses therein which are angularly disposed relative to said rear wall, said recesses and the portions of said side walls most adjacent said second end of said rear wall cooperatively defining a pair of transversely aligned hooks that engage said wire after the latter has been moved longitudinally over said guide edges into said recesses, with said rear wall and tab having angularly aligned openings formed therein through which said shank of said nail may pass when said shank slopes downwardly and inwardly relative to said wall, and when said nail is driven into said wall said head of said nail pressure-contacts said tab by frict'onal contact therewith to prevent said wall hook from pivoting when said picture is being hung and said wire guided into said recesses, with the exterior surface of said tab being disposed inwardly from the portions of said guide edges most adjacent thereto a distance greater than the thickness of said head to prevent said wire from engaging said head when said wire is being guided by said guide edges into said pair of hooks.

3,923,279

HANGER APPARATUS FOR SUPPORTING INTRAVENOUS CONTAINERS

James E. Gresley, 5510 Standish Drive, Fort Wayne, Ind. 46806, and Hugh S. Glidewell, 7130 S. Calhoun St., Fort Wayne, Ind. 46802

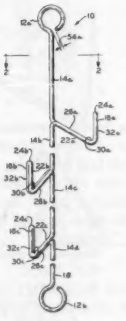
Filed Sept. 25, 1974, Ser. No. 509,243

Int. Cl.[2] A61G *12/00;* A47B *73/00*

U.S. Cl. 248—318 9 Claims

1. A hanger for intravenous containers which comprises a continuous piece of metallic bar being formed to include:

a. means on one end of said bar for supportably coupling said hanger to a support;
b. a plurality of hooks each being formed in said bar at different longitudinal locations in said bar; and
c. a stem comprising a plurality of parts of said bar, interconnecting said supporting means and one of said hooks, interconnecting and spacing each of said hooks at different longitudinal distances from said supporting means, orienting each of said hooks to open toward said supporting means, and rotationally displacing each of said hooks about said stem from the adjacent one of said hooks,



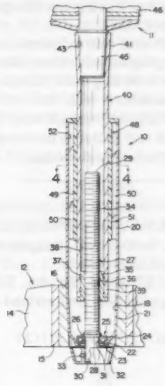
d. said hanger having a bottom end,
e. said one hook includes a radial arm portion that extends radially outwardly from said stem and downwardly toward said bottom end, a hook-shaped portion comprising a curved portion of said bar that extends outwardly and upwardly from the lowermost end of said bar portion, and a bail-retaining portion that comprises a portion of said bar that extends upwardly toward said coupling means a distance greater than the maximum size of the opening defined between the bottom of an intravenous container and a bail thereon.

3,923,280
ADJUSTABLE SUPPORT COLUMN FOR A PIVOTAL CHAIR

Wayne W. Good, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Mar. 21, 1975, Ser. No. 560,580
Int. Cl.² F16M *13/00*
U.S. Cl. 248—405 **6 Claims**

1. An adjustable support column for pivotally mounting the seat section of a chair to a base portion comprising: a sheath tube extending upwardly from the base portion; bearing means carried by said sheath tube; an adjusting screw supported by said bearing means for rotation relative to said sheath tube; knob means to control rotation of said adjusting screw; a spindle tube supporting the seat section extending downwardly therefrom; a bushing fastened to said spindle tube and threaded onto said adjusting screw to rotate with and with respect thereto; and, means to assure that the resistance to relative rotation between said bushing and said adjusting

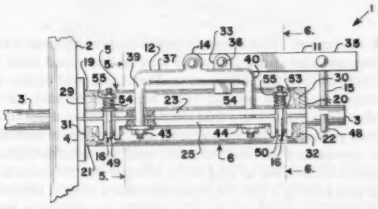


screw exceeds the resistance to relative rotation between said adjusting screw and said sheath tube.

3,923,281
CONCRETE FORM TIE CLAMP

Jesse C. Patterson, 9904 Linwood, Independence, Mo. 64052

Filed Apr. 15, 1974, Ser. No. 460,829
Int. Cl.² E04G *17/04*
U.S. Cl. 249—219 R **9 Claims**



1. A form tie clamp for retaining a form wall in a selected position during depositing concrete thereagainst, said form tie clamp comprising:
a. walls defining a first housing and a second housing each having a respective cavity therein, said first housing and said second housing being in facing relation, said first housing and said second housing each having a side wall and opposite end walls each having a passage therein to permit a rod extending outwardly from a respective form wall to extend therethrough, said first housing and said second housing each having opposite side flanges extending outwardly from said respective side wall thereof with the opposite side flanges of one of said housings being positioned in facing relation with said respective adjacent side flanges of the other of said housings;
b. a first clamping member and a second clamping member each positioned in the cavity in a respective one of said first housing and said second housing;
c. means mounted on the side wall of one of said first housing and said second housing and in engagement with the opposite side flanges of the other of said first housing and said second housing for selectively moving one of said first housing and said second housing toward the other housing and thereby moving said first clamping member and said second clamping member into clamped engagement with the rod extending outwardly from the respec-

tive form wall, said means for moving said clamping members into clamped engagement with the rod includes an elongated lever pivotally mounted on said side wall of said one housing and having the flange engaging means on one end thereof; and

d. means associated with said housings and said means for moving said clamping members into clamped engagement with the rod for retaining said clamped engagement of said clamping members with the rod, said means for retaining said clamped engagement of said clamping members with the rod includes means pivotally mounted on the other portion of said elongated lever.

3,923,282

VACUUM VALVE CONSTRUCTION

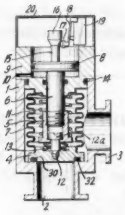
Albert Henzler, Mels, Switzerland, assignor to Balzers Patent- & Beteiligungs AG, Liechtenstein

Filed Nov. 22, 1974, Ser. No. 526,335

Claims priority, application Switzerland, Nov. 22, 1973, 016600/73

Int. Cl.² F16K *31/122*

U.S. Cl. 251—63.4 **5 Claims**



5. A vacuum valve construction, comprising a valve housing having an inlet and a discharge spaced from said inlet, means defining a valve seat between said inlet and said outlet, a valve shutter engageable on said valve seat to close said valve seat, a valve drive for driving said shutter, said valve drive including a drive plunger being movable in said housing, a second drive part connected to said shutter, and an intermediate drive member connected to said drive plunger for movement therewith and having a lost motion connection to said second drive part, said intermediate drive member comprising a part slidably engaged on said second drive part and movable between limits defined by abutment of a portion of said intermediate member with said second drive part and abutment of said intermediate member with said shutter, said drive plunger having a cam extension, an elastic member disposed between said intermediate member and said valve shutter in a position to be actuated by closing pressure of said drive plunger during the closing of said valve shutter to provide a locking force acting on said valve shutter to obtain a hermetic pressure contact of said valve shutter against said valve seat, and a switch having a switch actuating member with a roller follower disposed in the path of movement of said cam extension and being movable thereby only when said drive plunger is acting on said spring through said intermediate member to effect a hermetic pressure closing force.

3,923,283

FAUCET WITH CONTROLLED TORQUE CLOSURE

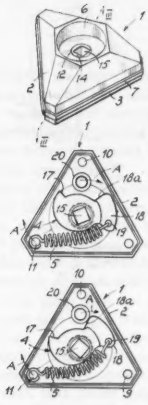
Umberto Tomiati, via del Filippini, 19, Verona, Italy

Filed Aug. 5, 1974, Ser. No. 495,151

Int. Cl.² F16K *31/44*

U.S. Cl. 251—77 **1 Claim**

1. A faucet knob device for faucets of the type having a screw type closing member to which the faucet device is adapted to transmit a controlled torque closing action, the knob device comprising a torque member having a shaft portion adapted for rigid rotatory connection coaxial with said screw type closing member, said shaft portion having external cylindrical bearing surface portions coaxial therewith, a knob head member having means integral therewith for slidably engaging said bearing surface portions in independent coaxial rotatory relationship therewith, spring means having one end thereof connected to said torque member in a point at a distance from the axis of said shaft portion and having the other end thereof connected to said knob head member in a point offset with respect to said shaft portion thereby to drag into rotation said torque member through said spring when said knob head member is rotated in a direction against the action of said spring and to transmit through said spring a torque creating force on said torque member when said spring is tensioned, a pair of opposite axially offset abutment means on said torque member and arranged circumferentially at a distance from one another to define a free space therebetween, a finger member rigid with said knob head member and protruding into said free space, said finger member being adapted to abut against one of said opposite abutment means when said knob head member is rotated by hand in the closing direction of said closing member against the action of said spring thereby to transmit first a spring controlled action to said torque member and to transmit thereafter rigidly the torque force from the hand action onto said closing member through the contact between said finger member and said one of said opposite abutment means, said finger member being further adapted to abut against the other of said opposite abutment means when the knob member is released from the hand action and the spring urges said head member to rotate idly in the opposite direction to bring said finger member in stopping engagement with said other of said opposite abutment means and to allow said closing member to be opened when an opposite hand action torque is transmitted rigidly from said knob head member to said other of said opposite abutment means through said finger member.



3,923,284

FAUCET VALVE

Ray E. Stickler, 10816 N. Lakeview, Milwaukee, Wis. 53092, and Glenn W. Hicks, 2749 N. 75th St., Wauwatosa, Wis. 53210

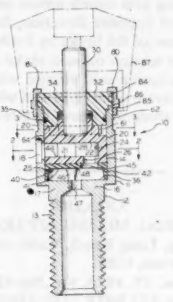
Filed Sept. 3, 1974, Ser. No. 502,542

Int. Cl.² F16K *25/00*

U.S. Cl. 251—172 **12 Claims**

1. A valve assembly including a housing defining a hollow chamber, inlet and outlet ports formed in spaced apart relation within said chamber, rotatable valve means disposed within said chamber and between said inlet and outlet ports, and a flexible sealing member disposed within said housing

and extending across said chamber, said sealing member being spaced from said inlet opening and being disposed between said inlet opening and said valve means for sealing said inlet opening from said outlet opening, a first opening formed in said valve means and offset from the rotational axis of said valve means, a second opening formed in said sealing member



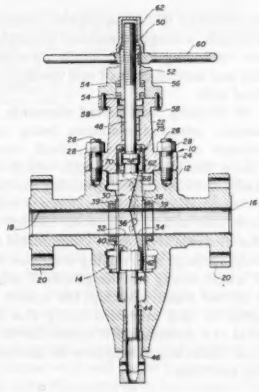
and offset from the rotational axis of said valve means, said valve means and said sealing member having complimentary engageable surfaces to provide a seal therebetween under the influence of water pressure when said openings are out of registry, said valve means being rotatable to move said first opening into and out of registry with said second opening.

3,923,285

STEM CONNECTION FOR GATE VALVES

Robert J. Diehl, and Larry E. Guthrie, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,313
Int. Cl.² F16K *3/314*; F16D *1/02*
U.S. Cl. 251—200 **6 Claims**



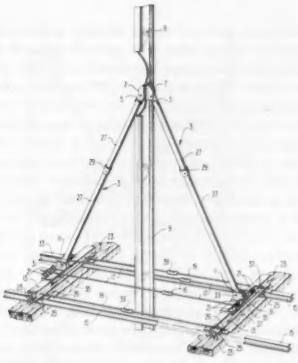
1. A gate valve structure comprising a valve body having a valve chamber therein and inlet and outlet flow passages communicating with the valve chamber, a gate valve mounted within the valve chamber for movement between open and closed positions and having a flow passage therein for alignment with said inlet and outlet flow passages, an extension on an end of said gate valve having an enlarged diameter end portion, an operating stem adjacent said extension having an enlarged diameter end portion in contiguous relation to said enlarged diameter end portion on the gate valve, a pair of split connector sections fitting about said enlarged diameter end portions, each split section having inner and outer semicircular openings receiving the respective stem and extension and an enlarged intermediate cavity between the inner and outer openings receiving the enlarged end portions, said connector sections when positioned over said enlarged end portions being of a generally cylindrical shape, an open ended cap fitting over the connector sections to hold the connector sections in position about the enlarged end sections of said stem and extension, and means to secure the cap over the connector sections.

3,923,286

SHORING AND JACKING RIG

Donald D. Raugh, Grosse Ile, Mich., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Nov. 19, 1974, Ser. No. 525,320
Int. Cl.² B66F *3/08*
U.S. Cl. 254—84 **12 Claims**



1. A shoring and jacking rig comprising
a. a plurality of spaced, parallel rail means,
b. a pair of spaced parallel beams with their length disposed at right angles to the length of the rail means,
c. rail engaging means affixed to the beams for slideably connecting the beams and the rail means for movement of the beams along the length of the rail means,
d. means associated with the rail engaging means preventing relative movement of the beams in a direction transverse to the length of the rail means,
e. a slideable support member resting on each beam intermediate the ends of the beam, each slideable support member having depending flanges snugly embracing the upper portion of the associated beam,
f. pivotal bearing means mounted on each slideable support member, both pivotal bearing means being located in a single plane parallel to the rails and perpendicular to the beams,
g. a pair of elongated compression members, each elongated compression member having its lower end pivotally connected to a different one of the pivotal bearing means, the pivotal connection between the lower end of each elongated compression member and the pivotal bearing means constraining the elongated compression members to pivoted movement in the single plane,
h. a pivot means at the upper end of each elongated compression member,
i. structural member engaging means pivotally connected to the pivot means at the upper end of each elongated compression member,
j. tension rod anchor means carried by each beam on each side of the single plane,

k. tension rod means connecting anchor means carried by one beam on one side of the single plane with anchor means carried by the other beam on the same side of the single plane,

l. tension rod means connecting anchor means carried by one beam on the other side of the single plane with anchor means carried by the other beam on the same side of the single plane, and

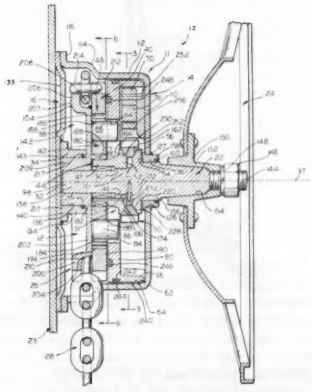
m. means associated with each tension rod means for decreasing the distance between beams and thereby raising the elevation of the structural member engaging means.

3,923,287

HAND BRAKE FOR RAILROAD CARS

Roger J. Weseloh, Glenwood, and Wajih Kanjo, Midlothian, both of Ill., assignors to Universal Railway Devices Company, Chicago, Ill.

Filed Nov. 6, 1974, Ser. No. 521,339
Int. Cl.² G05G *1/08*
U.S. Cl. 254—150 R **14 Claims**



1. A hand brake for railroad cars comprising:

a housing adapted to be mounted on a railroad car,

an operating shaft journaled in said housing for rotation about an axis extending longitudinally of said shaft,

a sleeve mounted on said shaft and coupled thereto for rotational movement therewith,

said sleeve having a cam portion that is in eccentric relation to said axis,

a winding drum journaled in said housing for rotational movement about said axis and having a brake chain coupled thereto for being wound thereby,

said winding drum including a ring gear portion,

a pinion journaled on said sleeve cam portion and meshing with said ring gear, in eccentric relation thereto, for rotating said drum about said axis,

a release wheel journaled in said housing for rotation relative to said housing about said axis,

means for releasably keying said wheel against said rotation thereof,

means for keying said pinion to said wheel for rotation therewith including means for accommodating gyration of said pinion relative to said ring gear and said wheel on rotation of said shaft and said sleeve relative thereto whereby when said wheel is keyed against said rotation of same relative to said housing rotation of said shaft and said sleeve about said axis effects rotation of said drum relative to said housing,

ratchet means acting between said shaft and said housing for accommodating rotation of said shaft in one direction to wind said chain and opposing rotation of said shaft in the opposite direction,

releasable clutch means acting between said shaft and said ratchet means for releasably clutching said shaft to said ratchet means under the tension in said chain to maintain said shaft against rotational movement in said opposite direction,

means for releasing said clutch means on hand rotation of said shaft in said opposite direction, for accommodating controlled release of the brake by limited rotation of said drum under the tension on said brake chain,

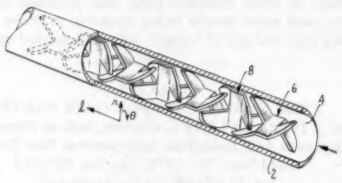
and means for releasing said release wheel keying means whereby said release wheel and said winding drum rotate relative to said shaft and sleeve to effect quick release of the brake.

3,923,288

MATERIAL MIXING APPARATUS

Leonard Tony King, Long Beach, Calif., assignor to Komax Systems, Inc., Carson, Calif.

Filed Dec. 27, 1973, Ser. No. 428,865
Int. Cl.² B01F *5/00*, *15/02*
U.S. Cl. 259—4 **10 Claims**



1. Stationary material mixing apparatus, comprising a conduit having a length, a longitudinal axis through said length, and a chamber extending longitudinally through said length opening on first and second ends of said conduit and including said longitudinal axis,

a plurality of abutting, self-nested elements fitted within said chamber, adjacent elements being configured as mirror images of one another, each element having lengths along the longitudinal axis where adjacent elements axially overlap defining mixing matrices inducing both counter-rotating angular velocities relative to said longitudinal axis and simultaneous inward and outward radial velocities relative to said longitudinal axis on materials moving through said mixing matrices, each element having a length along the longitudinal axis where said elements do not axially overlap, the axially non-overlapping lengths of said elements along the length of the longitudinal axis defining drift spaces for the recombination of said materials subsequent to movement through the mixing matrices.

3,923,289

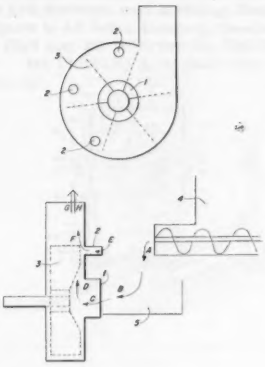
METHOD OF MIXING SOLIDS AND LIQUIDS ON A CONTINUOUS BASIS

Victor Danberg, 6 Mary Ann Lane, Wallingford, Conn. 06493

Filed Dec. 13, 1971, Ser. No. 207,173
Int. Cl.² B01F *5/12*
U.S. Cl. 259—22 **8 Claims**

1. A method of mixing materials on a continuous basis, comprising the steps of feeding a larger portion of fibrous material into the center suction point of a high pressure open

fan assembly, and feeding a smaller portion of materials into another inlet point located on the periphery of the same fan



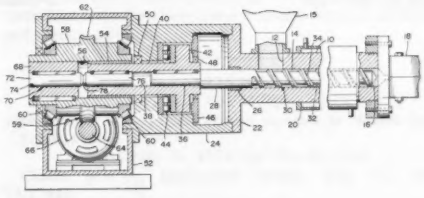
housing assembly and leading into the tips of the open fan rotor blades.

3,923,290

SHEAR CONTROL FOR EXTRUDER APPARATUS

Robert Tillis, 51 Harmon Road, Edison, N.J. 08817

Filed May 7, 1974, Ser. No. 467,807
Int. Cl.² B29B *1/06*
U.S. Cl. 259—191 **9 Claims**



1. Apparatus for extruding plastic material comprising

barrel means having inlet means for receiving material to be extruded and outlet means for exit of the material;

screw means disposed in said barrel means and including an elongate body extending longitudinally in said barrel means and a helical rib extending around said body;

drive means including motor means and reducer means coupled with and rotatably driven by said motor means and having output means driven at a speed less than the speed of said motor means; and

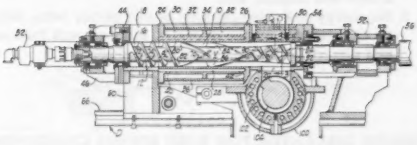
shear control means coupling said output means of said reducer means with said screw means to rotate said screw means to force the material to be extruded from said inlet means to said outlet means of said barrel, said shear control means including a coupling shaft having a portion of reduced cross-sectional area to control the breaking point of said coupling shaft, said portion of reduced cross-sectional area of said coupling shaft having a cross-sectional area less than the cross-sectional area of said body of said screw means such that said coupling shaft will break at said portion of reduced cross-sectional area to interrupt rotation of said screw means when the shear force between said screw means and said output means of said reducer means exceeds a predetermined value less than the shear force required to break said screw means.

3,923,291

INTERNAL MIXER

James T. Matsuoka, Brecksville, and Armindo Cantarutti, Akron, both of Ohio, assignors to Intercole Automation, Inc., Cleveland, Ohio

Division of Ser. No. 103,537, Jan. 4, 1971, Pat. No. 3,723,039, which is a continuation-in-part of Ser. No. 841,349, July 14, 1969, Pat. No. 3,700,374, and a continuation of Ser. No. 331,271, Feb. 8, 1973, abandoned. This application Sept. 12, 1974, Ser. No. 505,305
Int. Cl.² B29B *1/10;* **B01F** *15/02*
U.S. Cl. 259—192 **3 Claims**



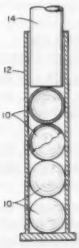
1. In a continuous internal mixer for processing plastics, and the like: a housing having two side-by-side interconnected substantially cylindrical material processing chambers having a first opening adjacent to one end through which material to be processed is charged and a second opening adjacent to the opposite end through which material is discharged; two rotors, one in each of said chambers, supported for rotation therein and each provided with material working blade portions in the mixing chamber oriented more lengthwise of the axis of the rotors than circumferentially thereof and twisting in opposite directions; an interrupted screw thread having a maximum diameter about equal to the interior diameter of said mixing chamber and lacking a full diameter thread convolution on each of said rotors at the downstream side of said material working blades; means for rotating said rotors; a cylindrical conduit offset from and extending transversely of the axes of said rotors communicating with said second opening; a rotatable screw in said conduit to convey material from said chambers; and means for rotating said screw at a controlled rate whereby the duration of the processing of material in said processing chambers is controlled.

3,923,292

ENERGY ABSORBING DEVICES

Baxter C. Madden, Jr., 680 N. Loop Drive, Camarillo, Calif. 93010

Filed Oct. 15, 1974, Ser. No. 514,532
Int. Cl.² F16F *3/07*
U.S. Cl. 267—64 R **14 Claims**



1. An energy absorbing device for controllably dissipating large amounts of impact load energy at a gradual rate without rebound or quick collapse of the device, comprising:

a. a housing means having an open end and a closed end;

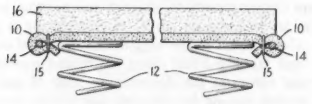
b. a piston means slidably disposed in the open end of said housing means;

c. at least one hollow body of substantially spherical configuration formed of ductile material arranged within said housing between said piston means and the closed end of said housing means;
d. loading forces applied to said piston means being absorbed by non-recoverable plastic deformation of said at least one ductile hollow spherical body, said at least one spherical body operable to deform greatly as said piston means moves in the direction of the closed end of said housing means with a steep and continuously increasing load applied thereto;
e. vent means allowing escape of any gases within said housing means as said piston means moves toward the closed end thereof; and
f. the energy absorbing capacity of said device being varied by changing any of the diameter, number, wall thickness and material of the ductile hollow spheres.

3,923,293
SPRING INSULATOR FOR WIRE SPRING CUSHIONING STRUCTURES SUCH AS MATTRESSES

Donald E. Wiegand, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed June 22, 1973, Ser. No. 372,785
Int. Cl.² F16F *3/04*
U.S. Cl. 267—94 **17 Claims**



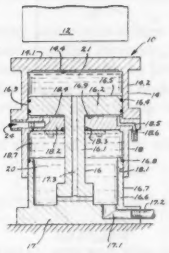
1. A spring cushion structure comprising a plurality of resilient metal wire springs which form a foundation the surface of which contains relatively large open spaces between a multiplicity of relatively small wire therein, a flexible polyethylene sheet of foam of a honeycomb type of cellular structure of less than about 1.0 inch thick with a density of less than about 6 pounds per cubic foot positioned at the top of the wire spring foundation to form a spring insulator for the wire spring foundation and a cushioning material positioned above said spring insulator, the resistance to compression of said spring insulator being greater than the resistance to compression of said cushioning material.

3,923,294
POWER PRESS DIE CUSHION WITH AIR DECELERATOR

Robert M. Gold, Minneapolis, Minn., and Robert M. Gold, Jr., Phoenix, Ariz., assignors to Dayton Rogers Manufacturing Co., Minneapolis, Minn.

Filed Oct. 21, 1974, Ser. No. 516,751
Int. Cl.² F16F *5/00*
U.S. Cl. 267—119 **11 Claims**

1. A controlled return pneumatic die cushion for a power press, the cushion having an air chamber under substantially constant pressure which respectively contracts and expands in volume as the cushion is decreased in height under the force of a power press ram and as the cushion recovers its original height when the force of the ram is removed, the cushion including a cavity which respectively expands and contracts in volume as the height of the cushion decreases and increases, the cushion including a decelerator valve for bleeding air in a controlled manner from the cavity to control the rate at which the cushion returns to its original height, the valve communicating with the air chamber and the cavity and responsive to

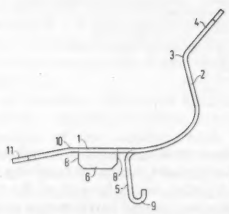


the ratio of cavity pressure to air chamber pressure to open when a given ratio has been exceeded.

3,923,295
SPRING CLAMP FIXABLE IN A CIRCULAR HOLE IN A PLATE OR PANEL

Kajetan Leitner, 817 Bad Tolz, am Winacker, Germany

Filed July 8, 1974, Ser. No. 486,660
Claims priority, application Germany, July 16, 1973, 2336184
Int. Cl.² F16F *11/26*
U.S. Cl. 267—158 **3 Claims**

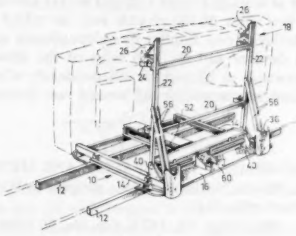


1. A spring clamp fixable in a circular hole in a plate or panel comprising an elongated strip of metal having an attaching contact fitting juxtaposed to said plate or panel over said circular hole, one end of said attaching contact fitting extending substantially at a right angle from said contact fitting away from said plate or panel, the other end of said contact fitting being curved towards said plate or panel, two oppositely-disposed guide lugs having axially extending edges whereby a centering arrangement is formed in relation to said circular hole and at least one holding lug, said guide lugs and holding lug lying intermediate the ends of said attaching contact fitting and extending into said circular hole in said plate or panel, the free end of said holding lug being bent towards said first mentioned end and engaging the inner surface of said plate or panel whereby said clamp is securely gripped by the said attaching contact fitting to secure the same to said plate or panel.

3,923,296
DEVICE FOR TILTING AUTOMOBILE BODIES ON AUTOMOBILE BODY ASSEMBLY LINES

Aake Fritiof Oksala, Alvangen; Bror Arne Vilhelm Hultberg, and Sven Erik Svensson, both of Hisings Backa, all of Sweden, assignors to AB Volvo, Goteborg, Sweden

Filed Aug. 26, 1974, Ser. No. 500,731
Int. Cl.² B23Q 3/18; B66F 3/08
U.S. Cl. 269—60 5 Claims

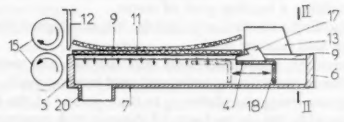


1. Device for tilting a motor vehicle body during assembly along an assembly line, comprising an underframe, a fastening frame supported by the underframe and having means for fastening the underside of the body to said fastening frame and tilting means connected to the underframe and the fastening frame for tilting the fastening frame relative to the underframe between a horizontal and vertical position, said tilting means comprising at least two trolleys which are movable horizontally in a transverse direction on the underframe by means of a horizontal driving arrangement, joint arms pivotably connected at one end to the underframe, the fastening frame being pivotably connected to the trolleys and to the other end of said joint arms, whereby when the trolleys are moved on the underframe, the fastening frame is tilted between a horizontal and vertical position.

3,923,297
APPARATUS FOR FEEDING SHEETS

Jean-Jacques Barny, Lyon, France, assignor to Martin, Saint-Priest, France

Filed May 21, 1974, Ser. No. 471,910
Claims priority, application France, July 31, 1973, 73.27945
Int. Cl.² B65H 3/24, 3/46
U.S. Cl. 271—132 3 Claims

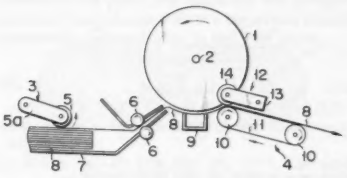


1. A device for successively feeding the bottom sheet from a stack of sheets into a treatment machine comprising a supporting table, front and rear stops on said table between which the stack is located, a casing closed at the sides and the bottom, means for coupling said casing to a suction device, spaced parallel bars extending in the direction of feed of the sheets and forming the top of the table, a reciprocating feeder, a transverse support bar for said feeder inside said casing and below the top bars of said casing, claws of the same width as the space between said top bars secured to said support bar and projecting upwards between and above said top bars to engage the bottom sheet at each reciprocation of said feeder, and a rear closure plate of the same transverse section as said casing, projecting under the support bar and forming a movable rear wall for said casing moving with said support bar.

3,923,298
COPYING PAPER FEEDING DEVICE FOR ELECTRONIC COPYING APPARATUS

Tsutomu Ishida, Musashino, Japan, assignor to Copyer Co. Ltd., Tokyo, Japan

Filed Sept. 28, 1973, Ser. No. 401,714
Claims priority, application Japan, Oct. 4, 1972, 47-115099[U]
Int. Cl.² B65H 29/56
U.S. Cl. 271—174 3 Claims



1. A copying paper feeding device for electronic copying apparatus provided with a rotation drum having a photosensitive surface, said copying paper feeding device including means for applying a copying paper onto the photosensitive surface of the rotation drum with at least one side edge of the copying paper extending beyond one side edge of the rotation drum, means for separating the copying paper from the rotation drum including a separation roller provided in proximity to said drum to be contacted with said one surface of said one edge and a guide plate member having a lower surface along which the copying paper is guided from the separation roller, said guide plate being swingable about the rotation axis of said separation roller and mounted adjacent said drum for slidingly contacting with one surface of said one side edge extending beyond said one side edge of said drum of the copying paper which faces the photosensitive surface, and transporting means to which the copying paper from said separating means is supplied.

2. A copying paper feeding device for electronic copying apparatus provided with a rotation drum having a photosensitive surface, said copying paper feeding device including means for applying a copying paper onto the photosensitive surface of the rotation drum with at least one side edge of the copying paper extending beyond one side edge of the rotation drum, and means for separating the copying paper from the rotation drum including a swingable guide plate member whose one end extends toward the inside of said drum to guide the copying paper along the lower surface of the guide plate and whose base end is pivoted, said guide plate having a flat under surface and a projection extending at an obtuse angle to the flat under surface, and being mounted adjacent said drum for slidingly contacting with one surface of said one side edge extending beyond said one side edge of said drum of the copying paper which faces the photosensitive surface.

3,923,299
METHOD AND APPARATUS FOR FORMING AN EVEN EDGED PILE OF FLEXIBLE SHEETS

Ruel E. Taylor, West Buxton, and Alston R. Wormwood, Gorham, both of Maine, assignors to Ruel E. Taylor, Inc., Gorham, Maine

Filed Oct. 3, 1973, Ser. No. 403,055
Int. Cl.² B65H 31/38
U.S. Cl. 271—221 18 Claims

1. The method of forming an even edged pile of flexible sheets delivered in a generally horizontal direction to the top surface of said pile comprising the steps of:

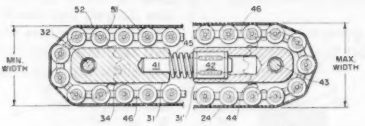
confining the opposite lateral edges of sheets delivered to said pile by contact with active surface area constraints spaced nominally the width of said sheets; and

moving said active surface area constraints continuously in the direction of travel of the delivered sheets while providing incremental oscillatory variation of the spacing between said surface area constraints on said opposite lateral edges by reciprocating said active surface areas substantially normal to said direction of travel to make said contact with said lateral edges along extended portions thereof during each reciprocation.

16. A jogger mechanism comprising:

a base adapted to be supported horizontally;

spaced vertical shaft means supported on said base;



sprocket gear means on said shaft means;

endless drive chain means engaged with said sprocket gear means;

jogger surface means supported on said drive means;

means for driving said sprocket gear means to move said jogger surface means along the peripheral path of said drive chain means with a transverse oscillatory motion component; and

means for tensioning said drive chain means between said sprocket gear means to make the peripheral portion of said drive chain means extending between said sprocket gear means move as a unit with said oscillatory motion component.

3,923,300

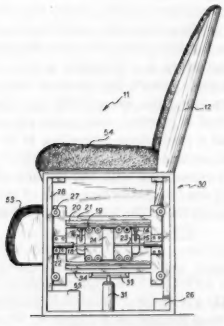
THEATER CHAIR AUTOMATICALLY MOVABLE BY REMOTE CONTROL

Antonio Tanus, Jose T. Cuellar No. 12, Col. Obrera, Mexico (8, D.F.)

Division of Ser. No. 354,065, April 24, 1973, Pat. No. 3,865,430. This application Nov. 29, 1974, Ser. No. 528,525

Int. Cl.² A47C 1/12; A63J 5/00; A63G 31/16

U.S. Cl. 272—18 **6 Claims**



1. A theater chair movable by remote control, comprising a supporting structure, a chassis with a backrest and two armrests integral therewith and installed on the supporting structure, a seat connected to the chassis so as to be rotatable with respect thereto, and vibrational means within said seat, the supporting structure comprising, at each side of the chassis:

a rigid frame;

a first fluid-actuable ram device supported by said rigid frame;

a first plate connected to be acted upon the first ram device to be displaced vertically thereby;

a second fluid-actuable ram device supported by said first plate; and

a second plate connected to be acted upon by the second ram device to be displaced horizontally thereby,

the second plate at one side of said chassis being connected to said one side of said chassis through at least one ball and socket universal joint and the second plate at the other side of said chassis being connected to said other side of said chassis by way of at least one other ball and socket universal joint so that the two sides of the chassis may be raised or lowered independently of one another by independently actuating the first ram devices and the two sides of the chassis may be moved forwards or backwards independently of one another by independently actuating the second ram devices.

3,923,301

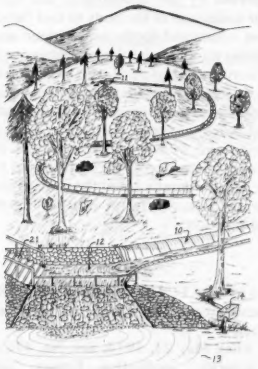
AMUSEMENT WATER SLIDE AND METHOD

Dwight L. Myers, Mocksville, N.C., assignor to Water-Boggan, Inc., Mocksville, N.C.

Filed Sept. 19, 1974, Ser. No. 507,400

Int. Cl.² A63G 21/18

U.S. Cl. 272—56.5 R **9 Claims**



1. The method of adapting the topography of a hill to a water slide amusement device, which method comprises:

a. providing a landing pool of water;

b. providing a starting point on the hill at a higher elevation than said landing pool;

c. providing a slideway dug into the hill and extending between the starting point and said landing pool;

1. conforming the slideway to the contour of the land to provide the desired rate of descent and curvature,

2. introducing water into the slideway at said starting point, and

d. providing a mat for each rider.

3,923,302

PORTABLE MOUNT FOR GYMNASTIC POLE

Robert Boggild, Graham Home Place Road, South Pittsburg, Tenn. 37380

Filed Feb. 7, 1975, Ser. No. 547,821

Int. Cl.² A63B 9/00

U.S. Cl. 272—60 A **10 Claims**

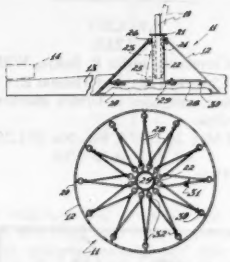
1. A mount and flexible gymnastic pole combination comprising

a body having a surface engaging base and an upper opening,

removable means for securing said base against tipping with respect to the surface which it engages,

a socket disposed within said body,

resilient means securing one end of said socket to said body, the other end of said socket being universally pivotable



with respect to said body whereby said socket, when stressed can tilt with respect to said body,

and a flexible pole mounted in said socket and being supported at its lower end by spaced upper and lower elastomeric bushings which permit said pole to flex within said socket.

3,923,303

RACKET AND STRING HOLDING ELEMENTS

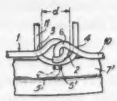
Jean Rene Lacoste, Paris, France, assignor to Patentex S.A., Fribourg, Switzerland

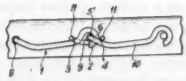
Filed Feb. 4, 1974, Ser. No. 439,617

Claims priority, application France, Feb. 9, 1973, 73.04680

Int. Cl.² A63B *51/00*

U.S. Cl. 273—73 D **1 Claim**





1. A racket structure comprising:

a racket frame;

a plurality of holes formed along an inner wall of said frame in spaced relationship;

a plurality of interlinked attachment elements made of a wire material and arranged along said frame, each of said elements having an end portion forming an s-shaped lug, a substantially straight elongated middle portion, a bent portion bent away from said straight portion, and another end portion forming a hook substantially shaped as an open circular loop at said bent portion, the lug of each attachment element having a first bend at least partly engaged in one of the holes of said frame, a connecting portion and a second bend extending outside of the respective hole over a length greater than the cross-sectional size of the wire material by a predetermined amount, and the hook of a first attachment element being engaged around the second bend of the lug of a second attachment element adjacent to said first element;

stringing spanning said frame in a plurality of runs, said stringing consisting of a string material having a cross-sectional size not greater than said predetermined amount, and having stringing loops between said runs, each of said stringing loops passing across the bent portion of a first attachment element, then across the hook of said first element between the hook and said frame, around the connecting portion of a second attachment element adjacent to said frist element and finally within the second bend of the lug of said second element, outside of the hook of said first element engaged around the lug of said second element, whereby the space between adjacent runs of the stringing is substantially predetermined by the outer diameter of the substantially circular open hook of each attachment element, and wherein the lugs of the attachment elements and the stringing lie substantially in a common first plane, the hooks and the straight middle portions of said elements lie in a respective second plane, substantially perpendicular to said first plane.

3,923,304

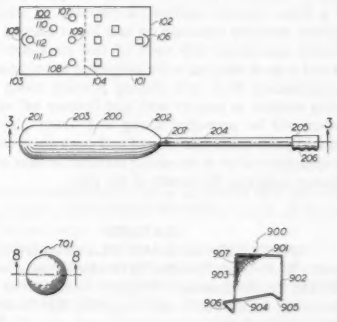
SURFACE BALL GAME AND APPARATUS

John E. C. Warren, 509 Riverside Drive, Melbourne Beach, Fla. 32951

Division of Ser. No. 407,518, Oct. 18, 1973. This application May 31, 1974, Ser. No. 475,230

Int. Cl.² A63B *59/00*

U.S. Cl. 273—95 R **10 Claims**



1. A surface game on a playing field with a dividing center line involving a plurality of players on each of two sides and apparatus therefor, said apparatus comprising in combination a goal of lightweight framing supporting a net at each of longitudinal ends of said playing field, a soft lightweight playing ball of substantial diameter, and a lightweight injury-free players stick for each of said players, said players stick comprising a solid substantially cylindrical resilient foam ball striking body having a length about three times the diameter, an external protective and frictional skin means on said striking body, a central longitudinal bore about six inches deep in said striking body, and a flexible handle means in said bore and extending a substantial distance therefrom.

3,923,305

COMBINED GAME OF CHANCE AND SKILL

Lawrence L. Reiner, 1 Hickory Lane, Woodbury, L.I., N.Y. 11797, and William A. Brady, 201 Cross St., Fort Lee, N.J. 07024

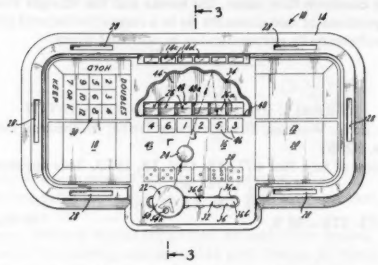
Filed Feb. 4, 1974, Ser. No. 439,212

Int. Cl.² A63F *7/10, 9/00*

U.S. Cl. 273—126 R **2 Claims**

1. A combined game of chance and skill comprising a game board including a playing field having a playing position and a rebound bumper spaced from said playing position, a puck-propelling mechanism, said puck-propelling mechanism including a housing, a trigger mechanism within said housing,

said trigger mechanism including a puck-receiving seat for receiving said puck, and locking means for holding said trigger mechanism in a cocked position, said locking means including a cam formed in said housing and a cam follower attached to said puck-receiving seat for camming said trigger mechanism into its cocked position within said housing, said locking means further including an actuating hole formed in said housing and a lock formed on said trigger mechanism adapted to be inserted through said actuating hold to maintain said trigger mechanism in its cocked position, means for mounting said puck-propelling mechanism at said playing position,



means dividing said game board into an upper playing surface and a lower playing surface, a plurality of puck-receiving members movably mounted on said lower playing surface, an indicator associated with each of said puck-receiving members and a puck adapted to be propelled by said puck-propelling mechanism from said playing position along said upper playing surface to impact with and bounce off said rebound bumper and be propelled along said lower playing surface until said puck drops into one of said puck-receiving members and actuates said puck-receiving member so that its associated indicator indicates the result of the play.

3,923,306

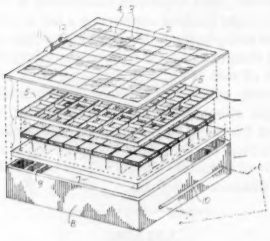
EDUCATIONAL GAME PLAYING DEVICE

Gerardo R. A. Cahn-Hidalgo, 5024 Allan Road, Bethesda, Md. 20016; Emilio Castanón-Pasquel, 16213 Grist Mill Drive, Rockville, Md. 20853, and Jorge Del Rio Roldan, Ricardo Palma, Miraflores, Lima, Peru

Filed Oct. 18, 1974, Ser. No. 516,086

Int. Cl.[2] A63F *3/02*; G09B *1/00*

U.S. Cl. 273—136 A **12 Claims**



1. A game playing device comprising a housing having a top game playing surface, said game playing surface defining a plurality of game positions, an illuminating element disposed below each of said game positions, connector plate means disposed in said housing, a plurality of sensing means disposed above said connector plate means, means for progressively introducing a sheet containing punched information bit locations into said housing between said connector plate means and said plurality of sensing means, each of said sensing means being adapted to contact said connector plate means through said bit locations, and electrical circuit means providing electrical connection between said connector plate means and said illuminating means, so that when the sensing means contact said connector plate means through the bit locations in the information sheet one or more illuminating elements is actuated.

3,923,307

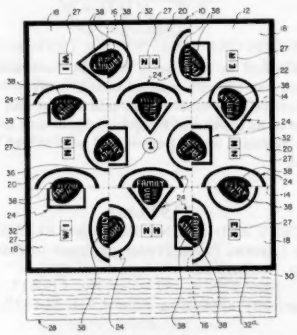
PUZZLE

V. John Sukys, Cleveland; Julius P. Sukys, Willowick; Harry E. Edelmann, Chagrin Falls, and Thomas E. Condon, Willowick, all of Ohio, assignors to C/M/S Marketing Corporation, Mentor, Ohio

Filed May 20, 1974, Ser. No. 471,296

Int. Cl.[2] A63F *9/10*

U.S. Cl. 273—157 R **13 Claims**



1. In a puzzle, a flat sheet of severable material having a peripheral edge, line means dividing said sheet into sections, indicia on said sections, said indicia on at least certain of said indicia carrying sections comprising plural indicia species including letter indicia species and plural partial geometric-like indicia species, said sheet comprising indicia carrying sections disposed in adjacent aligned equal length parallel rows, said geometric-like indicia species being disposed along said dividing line means, the central of said sections having said geometric-like indicia species disposed along all of the dividing line means defining its area, said other sections having said geometric-like indicia species disposed only along said dividing line means defining the area of each of said other sections with none disposed along said peripheral edge, said partial geometric-like indicia species generally not cooperating to form conventional geometric configurations along said dividing line means, said sections being severable from one another along said dividing line means and being adapted for attempted reassembly into matched relation to form conventional geometric configurations from said partial geometric-like indicia and at least one dictionary word from said letter indicia whereby said complete conventional geometric indicia configurations appear along all of said dividing line means associated with each of said sections with none disposed along the peripheral edge, when said sections are matched into said geometric configurations with formation of said word.

3,923,308

SLOTTED GOLF PUTTER

Truett P. Mills, 1700 Second Ave., Tuscaloosa, Ala. 35401

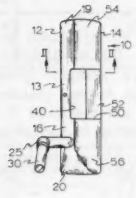
Filed Sept. 17, 1973, Ser. No. 397,734

Int. Cl.[2] A63B *69/36*, *53/04*

U.S. Cl. 273—183 D **5 Claims**

1. A golf putter comprising a putter head, said putter head having a frontal striking surface, a top surface, a bottom surface and a rear surface and toe and heel portions, said head having a vertical slot extending therethrough, said slot having sufficient width and length dimensions to permit substantial

visual observation therethrough, the width of said slot being greater than the thickness of said putter head between said slot and said frontal striking surface, said top surface of said head further having a cutaway portion contiguous with said



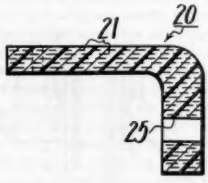
slot along the length thereof and extending rearwardly completely through said head, said cutaway portion being further defined by side walls therealong, said side walls extending substantially along a vertical plane, and a shaft secured to said putter head and extending upwardly therefrom.

3,923,309

CARTRIDGE SHELL FOR PHONOGRAPH PICKUP

Heitaro Nakajima; Hirotake Kawakami, both of Tokyo; Shokichi Tatara, Yokohama, and Jun Kishigami, Tokorozawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 17, 1974, Ser. No. 489,073
Claims priority, application Japan, July 21, 1973, 48-85141
Int. Cl.[2] G11B *3/10*
U.S. Cl. 274—23 R **6 Claims**



1. A cartridge shell for use with a phonograph, said cartridge shell being mounted on one end of a tone arm and said shell supporting a phonograph cartridge, said shell being composed of carbon fibers bonded together by means of a synthetic resin, said shell possesses a high internal loss so that said shell effectively damps vibrations, is light in weight to provide quick response, and reduces resonance phenomena with high rigidity.

3,923,310

FLIGHTS FOR DARTS AND ARROWS

Stanley Robert Lowy, South Croydon, England, assignor to Unicorn Products Limited, London, England

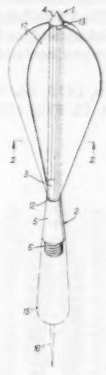
Filed June 14, 1973, Ser. No. 369,877
Claims priority, application United Kingdom, Aug. 11, 1972, 37585/72
Int. Cl. A63b *65/02*; F41b *5/02*
U.S. Cl. 273—106.5 C **9 Claims**

1. A flight comprising an elongate stem having a periphery of predetermined regular shape symmetric about an axis of symmetry of the stem, a plurality of flight wings each having a stem attachment edge extending substantially the whole length thereof, and means mounting the stem attachment edge of each flight wing to said stem such that said flight wings radiate outwardly of said stem periphery with said elongate stem extending longitudinally beyond each end of the stem attachment edge of each of said flight wings, said flight being characterised in that:

i. the elongate stem has a plurality of integral flight wing alignment and stem stiffening ribs of substantially uniform cross-section that extend longitudinally of the stem for at least the length of said attachment edges, radiate from said stem periphery about periphery locations spaced equiangularly of said axis of symmetry, and project outwardly of the stem periphery by a short distance;

ii. each of said flight wing alignment and stem stiffening ribs has two opposite side surfaces that are

a. planar and parallel to one another and to a radius from said axis of symmetry, whereby at least one of said



surfaces constitutes a planar alignment face for a radiating flight wing adjacent the entire length of the stem attachment edge thereof, and

b. spaced apart by a distance that is substantially less than the angular distance, along the stem periphery, between the ribs of neighbouring locations, whereby said ribs provide stiffening of the stem; and

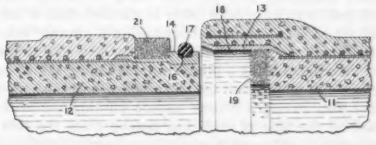
iii. each flight wing laterally abuts the planar alignment face of an associated one of said ribs to be thereby aligned longitudinally of said stem and have its said attachment edge laterally protected by said rib along the entire length of said stem attachment edge extending substantially the whole length of said flight wing.

3,923,311

STRUCTURAL POLYURETHANE FOAM SYSTEM WITH AN INORGANIC ALKALINE SEALANT SUSPENDED THEREIN

Irving Tashlick, Bradley Beach, N.J., assignor to Interpace Corporation, Parsippany, N.J.

Continuation-in-part of Ser. Nos. 359,967, May 14, 1973, and Ser. No. 414,144, Nov. 9, 1973. This application Apr. 18, 1974, Ser. No. 462,041
Int. Cl.[2] F16J *15/10*
U.S. Cl. 277—1 **45 Claims**



1. A process for sealing a space against flow of a fluid therethrough by placing relative a structure a dry hydratable ce-

ment, which is reactive with water to hydrate, the process comprising:

introducing the hydratable cement into at least one precurser of a urethane material,

causing the urethane material to foam and polymerize so as to produce a foamed polyurethane material with the hydratable cement dispered therein,

placing the foamed polyurethane material relative the structure, and

allowing the foamed polyurethane material to be contacted with water whereby the hydration takes place.

3,923,312

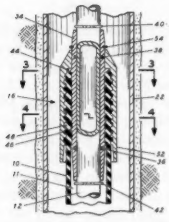
FORCE FIT INFLATABLE PACKER CLAMP

Stanley O. Hutchison, Bakersfield, and Neal L. Mitchell, Taft, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 10, 1973, Ser. No. 423,593

Int. Cl. F16J *15/40*

U.S. Cl. 277—34.6 **7 Claims**



1. An inflatable packer comprising a tubing section, an elongated resilient sleeve member slideably positioned over said tubing section, force fit clamping means engaging said sleeve member and compressing said sleeve member near the ends thereof to disconnectably connect each end of said sleeve member in fluid-tight relationship with said tubing section to form an annular chamber between said tubing section and said sleeve member and port means providing a passageway for flowing fluid into said annular chamber to inflate said resilient sleeve member.

3,923,313

SELF-ADJUSTING GREASE-SEALED ARTICULAR JOINT

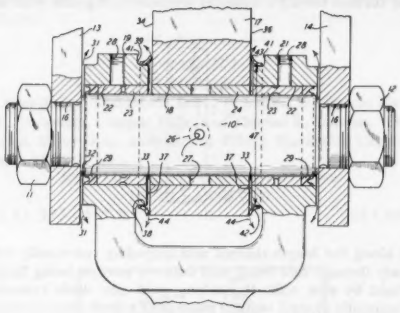
Leonard B. Bailey, Palestine, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed May 22, 1975, Ser. No. 579,798

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—63 **6 Claims**

1. A self-adjusting grease-sealed articular joint comprising a pin establishing an axis of articulation of the joint, two members encircling said pin and being relatively movable toward and away from each other in the direction of the axis of said pin, one of said members having a circular boss disposed adjacent the other of said members and with said other of said members having a planar surface facing said boss and being of a size larger than the diameter of said boss, said one member also having a planar surface continguous with and disposed to the side of said boss spaced from the first said planar surface, and an elastomeric grease-seal ring of an annular shape disposed on said boss and having an internal diameter less than the diameter of said boss and stretched onto said boss and be deflected into a concave shape with the outer circumference of said ring disposed against the first said planar surface, and with said ring thereby disposed in the space



between said planar surfaces and present a grease seal therebetween.

3,923,314

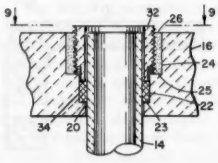
NON-RIGID SEAL FOR JOINING SILICON CARBIDE TUBES AND TUBE SHEETS IN HEAT EXCHANGERS

Harry A. Lawler, Youngstown, N.Y., and John Reys, Solon, Ohio, assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,441

Int. Cl. F16l *37/00, 41/00*

U.S. Cl. 277—112 **5 Claims**



1. An impermeable non-rigid seal in a heat exchanger; said seal comprising:

a. a silicon carbide tube sheet having an inner surface and an outer surface, said sheet having at least one first circular opening therethrough, said opening having walls essentially perpendicular to said surfaces, and a silicon carbide tube inserted into said opening;

b. said silicon carbide tube sheet having a second circular opening countersunk in said outer surface, said second opening being axially concentric with said first opening and having a diameter substantially greater than that of said first opening, the sides and bottom of said second opening defining a first chamber;

c. a packing material located in said first chamber and positioned around said tube;

d. said silicon carbide tube sheet having a third opening countersunk in said outer surface, said third opening being axially concentric with said first and second openings and having a circumference substantially greater than that of said second opening, the walls and bottom of said third opening defining a second chamber;

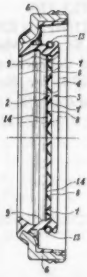
e. a packing compression means encircling said tube, said means comprising a ring of machinable material bonded to and supported by the walls and bottom of said second chamber, said ring having the opening therein axially concentric with and having a substantially larger diameter than said tube, said ring opening having a thread machined therein; and

f. a cylindrical packing follower encircling said tube, said follower having an external thread machined thereon for engagement with the thread machined in said ring opening for compression of said packing material around said tube upon rotation of said follower.

3,923,315
FLUID SEAL

Bernard Milton Hadaway, Highett, Australia, assignor to Repco Research Propietary Limited, Australia

Filed Apr. 9, 1973, Ser. No. 349,174
Claims priority, application Australia, Apr. 10, 1972, 8545/72
Int. Cl.² F16J 15/32
U.S. Cl. 277—134 4 Claims

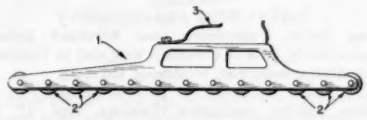


1. A fluid seal having a generally annular body of resilient material, said body including an axially inner surface and an axially outer surface which converge to define a circular sealing edge for engagement with a machine component, an annular barrier wall located adjacent said axially outer surface and in axially spaced relationship from said sealing edge, said barrier wall projecting generally in the same direction as said sealing edge so that a fluid catchment groove is formed between said axially outer surface and the adjacent side of said barrier wall, a bi-direction pumping configuration on said axially outer surface to direct fluid towards said sealing edge during relative rotation between said seal and said machine component, said configuration comprising a series of ribs, each said rib disposed so as to extend entirely between said sealing edge and said barrier wall side at an angle relative to said sealing edge, and each alternate said rib extending substantially parallel to each other and angularly relative to the immediately adjacent said ribs whereby said barrier wall deflects fluid on to the pumping configuration so that it will be influenced towards the sealing edge.

3,923,316
GRASS-SKI

Richard S. Birnbaum, 111 E. 64th Ave., Philadelphia, Pa. 19120, and Bruce H. Birnbaum, 13540 Youngwood Turn, Bowie, Md. 20715

Filed Dec. 27, 1973, Ser. No. 428,711
Int. Cl.² A63C 17/04
U.S. Cl. 280—11.22 6 Claims



1. A ski structure comprising a frame including a pair of rigid side plates, a plurality of reinforcing strut members extending between said side plates, and a support platform extending between said side plates, and a plurality of wheel assemblies secured to and extending between said side plates and longitudinally spaced therealong, at least one of said strut members located below the axis of rotation of said wheel assemblies and adjacent the lower edge of the side plates to substantially prevent cambering of the lower edge of said side plates.

3,923,317
SKI POLE HAND/WRIST ATTACHMENT

Donald Armstrong Penney, 365 Virginia, Salt Lake City, Utah 84102

Continuation-in-part of Ser. No. 315,882, Dec. 18, 1972, Pat. No. 3,879,048. This application Aug. 5, 1974, Ser. No. 494,743
Int. Cl.² A63C 11/22
U.S. Cl. 280—11.37 H 10 Claims

1. In combination in a ski pole having a handle portion, an attachment comprising

a cuff member made of a band of material formed into a loop for placement about a skier's hand, said cuff member being open at a single point thereof forming a break in said loop and wherein the ends of the band formed at the break may be spread apart from a first attitude to enable slipping the hand or wrist through the opening into the cuff member and then returned to the first attitude, and

means joining the cuff member to the handle portion of the ski pole.

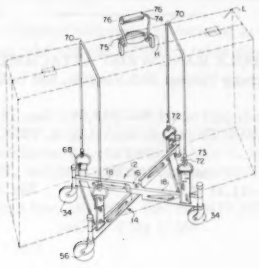
3,923,318
PORTABLE LUGGAGE OR LOAD CARRIER

Charles J. Renard, 356 Vincent Place, and Louis L. Rifken, 344 Vincent Place, both of Elgin, Ill. 60120

Filed Dec. 3, 1973, Ser. No. 420,958
Int. Cl.² B62B 3/04
U.S. Cl. 280—35 4 Claims

1. A portable luggage or load carrier comprising, a pair of arms, namely, a first arm and a second arm both of similar shape, each said arm having a central portion and oppositely extending sections, with one of said sections parallel to but offset from the other section, said pair of arms pivotally connected together at their respective central portions so that the arms may be positioned substantially parallel to each other when collapsed and positioned to form a substantially X-configuration when in load carrying position, wheel means secured adjacent the outer end of each of said arms whereby the carrier may be rolled or wheeled on a floor or ground surface,

an opening in each of said arms adjacent the outer ends thereof, a pair of straps at each of the opposite ends of said arms, one of each pair of straps anchored to said first arm and passing through the opening in the second arm and the other of said pair of straps anchored to said second arm and passing through the opening in said first arm so that when the ends of



the opposite straps are pulled outwardly away from each other the pair of arms will pivot toward each other, and means associated with each pair of straps and extending over the luggage or load supported on said carrier to secure said luggage or load on said carrier whereby the luggage or load may be moved with the movement of said carrier.

3,923,319

STEERING APPARATUS FOR VEHICLES

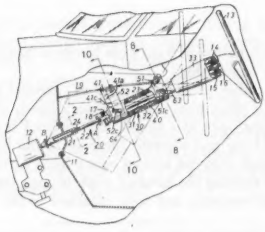
Masakatsu Nonaka, and Toshi Onuma, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 24, 1974, Ser. No. 482,579

Claims priority, application Japan, July 4, 1973, 48-75359

Int. Cl.[2] B62D *1/18*

U.S. Cl. 280—87 R **9 Claims**



1. A steering apparatus for a vehicle comprising:

a steering shaft assembly including a first shaft of which the lower end is foldably connected to a steering gear of the vehicle by way of a first universal joint and a second shaft of which the lower end is foldably connected to the upper end of said first shaft by way of a second universal joint and the upper end is connected to a steering wheel, said first shaft being axially displaceable relative to said second shaft,

a column tube assembly including an inner column tube coaxially surrounding and journalling said second shaft therein and separated at its lower end in a predetermined distance from the front wall of the vehicle compartment, an outer column tube coaxially surrounding said inner column tube therein and separated at its lower end in a predetermined distance from the front wall of the vehicle compartment, and an impact energy absorbing means between said inner and outer column tubes for absorbing a secondary impact energy exerted on said inner column tube from the steering wheel in a secondary collision;

a front supporting means mounted on a vehicle body structure for supporting the lower portion of said outer column tube and including means permitting forward displacement and disengagement of said outer column tube relative to said front supporting means by the secondary impact energy; and

a rear supporting means mounted on the vehicle body structure for supporting the upper portion of said outer column tube and including means permitting forward displacement of said outer column tube relative to said rear supporting means and comprising a pivot for said outer column tube in a secondary collision; whereby in a vehicle collision said outer column tube is displaced forwardly by the secondary impact energy exerted thereon and swings downwardly or upwardly around said pivot of said rear supporting means to effect said impact energy absorbing means.

3,923,320

WAGON FOR TRANSPORTING AN ERECTED SCAFFOLD

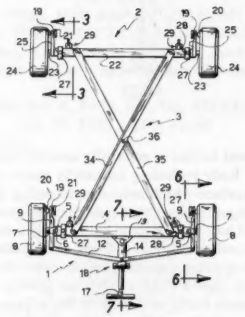
Andre Favreau, 28 Durham St., and Marcel Houle, 61 Mansfield Place, both of Dollard des Ormeaux, Quebec, Canada

Filed Nov. 26, 1974, Ser. No. 527,298

Claims priority, application Canada, Mar. 5, 1974, 194136

Int. Cl.[2] B60P *3/00*; B62D *21/06*

U.S. Cl. 280—103 **7 Claims**



1. An erected scaffold transporting wagon comprising a front wheel and axle assembly, a rear wheel and axle assembly, frame means disconnectably joining into a wagon configuration said front and rear assemblies in predetermined spaced parallel relationship and comprising a pair of bars pivoted intermediate their ends and detachably connected at their opposite ends to said front and said rear assemblies, allowing for tilting of either said front or said rear assembly in a plane perpendicular to an axis longitudinal to said wagon configuration, a pair of pins projecting lengthwise upwright in spaced-apart relationship on each of said front and rear assemblies and adapted to removably engage into the bottom opening of tubular legs of a scaffold section, said front wheel and axle assembly including steerable wheels and a steering mechanism connected to said steerable wheels for steering thereof, and a steering control device connected to said steering mechanism, and actuating the latter to steer the wagon.

3,923,321

SAFETY BELT ARRANGEMENT

Andreas Bauer, Fallersleben, and Bernhard Ruhmann, Braunschweig, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Sept. 10, 1974, Ser. No. 504,830

Claims priority, application Germany, Sept. 12, 1973, 2345847

Int. Cl.[2] B60R *21/10*

U.S. Cl. 280—150 SB **17 Claims**

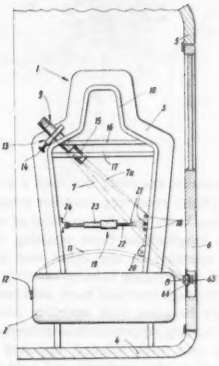
1. A safety belt arrangement for a vehicle seat having a seat

portion and a back portion extending upwardly from the seat portion, said arrangement comprising:

a. a safety belt for restraining the body of a passenger against the vehicle seat;

b. means for mounting the safety belt at a first point adjacent the seat portion of the vehicle seat; and

c. means for positioning the safety belt so that at least a portion of the safety belt extends from the first point in a direction transverse of the vehicle seat to a second point that is adjacent the back portion of the vehicle seat, said portion of the safety belt extending diagonally across the back portion of the vehicle seat and being adapted to extend diagonally across an upper portion of the body of



a passenger seated in the vehicle seat, the positioning means being adjustable selectively to vary the location of the second point at least in a vertical direction, wherein the positioning means includes:

i. bracket means holding the safety belt and defining the second point to which the portion of the safety belt extends;

ii. guide means mounting the bracket means so that the bracket means is movable relative to the guide means, the guide means being secured on a structural member coupled to the vehicle body; and

iii. actuating means operatively engaging the bracket means with the guide means for selectively moving the bracket means relative to the guide means.

3,923,322

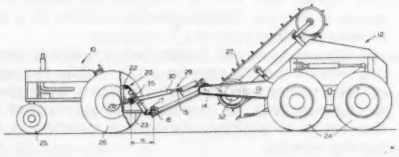
TRACTOR HITCH ADAPTER

James E. Hancock, Lubbock, Tex., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 29, 1974, Ser. No. 501,562

Int. Cl.² B60D *1/16*

U.S. Cl. 280—461 A **7 Claims**



1. A hitch adapter for a tractor vehicle having hitch means on the rear for towing an implement including an upper draft mounting and a lower draft mounting and a power take-off means between the two draft mountings adapted to drive an auxiliary unit being towed by the tractor hitch means, the hitch adapter having spaced leg portions being extendable generally downwardly and rearwardly between said upper and lower draft mountings providing a plurality of linearly adjusted positions, a draft coupling means including spaced plates adjacent the leg portions, and adjustment means including spaced, transversely aligned openings in said leg portions and plates, the one containing a pair of slots in aligned relation with openings in the other permitting the draft coupling means to be angularly adjustable on a transverse axis adjacent the lower end of said leg portions to a position corresponding to one of the linear positions of said leg portions adjusted to a position for maintaining the auxiliary unit in substantially the same relation to the power take-off means for one tractor hitch as for another whereby said hitch adapter permits said auxiliary unit to be coupled to different tractors.

3,923,323

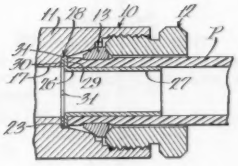
TUBE FITTING

Patrick J. Brogan, Sleepy Hollow, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 430,173

Int. Cl.² F16L *17/02, 37/08*

U.S. Cl. 285—3 **10 Claims**



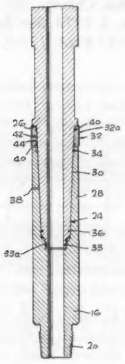
1. In a tube fitting having a body provided with a through bore, and a one-piece element defining a frangibly connected nut and sleeve, said element being provided with a through bore adapted to receive coaxially the end of a tube to be connected to the fitting with the distal end of the tube projecting from the sleeve, said body bore defining a right cylindrical inner recess adapted to receive coaxially the projecting distal end of the tube for supporting and centering the tube end during make-up of the fitting, said recess having an outer diameter preselected to be slightly larger than the outside diameter of said distal end of the tube for facilitated insertion of said distal end of the tube thereinto during said make-up of the fitting, and having an inner diameter substantially equal to the inner diameter of said distal end of the tube, the inner end of said recess being defined by a radial, planar surface defining means for effectively positively fixing said distal end of the tube against longitudinal inward movement from a preselected inserted position in the body bore, said sleeve having a longitudinally inner nose portion defined by a radial inner end surface and a frustoconical outwardly widening surface, said sleeve further having a longitudinally outer portion defined by a radial outer end surface, a frustoconical outwardly narrowing surface, and a radial, annular surface at the inner, wide end of said outwardly narrowing surface, said body bore further defining a camming portion outwardly of said inner recess and tapering into said recess for causing constrictive mounting of said element sleeve to the supported, centered, and longitudinally fixed tube end and separation of said element sleeve from said element nut during said make-up of the fitting, said sleeve being frangibly connected to said nut at said outwardly narrowing surface, said nut having a longitudinally inner portion defining a longitudinally outer, outwardly narrowing frustoconical surface and a longitudinally inner radial stop surface, said radial annular surface of said sleeve abutting said radial stop surface of said nut in the made-up arrangement of the fitting to provide a preselected constriction of the longitudinally outer portion of the sleeve by engagement of said nut inner portion with said sleeve outer portion frustoconical

surface, said sleeve inner end surface having an unconstricted outside diameter substantially larger than the diameter of said body bore recess.

3,923,324
DRILL COLLAR WITH THREAD CONNECTIONS

James R. Cruickshank, Ras Beirut, Lebanon, and Rainer Jürgens, Westercelle, GDR, Germany, assignors to Christensen Diamond Products Company, Salt Lake City, Utah

Filed Jan. 14, 1974, Ser. No. 433,142
Claims priority, application Germany, Mar. 20, 1973, 2313664
Int. Cl.[2] F16L *21/02*
U.S. Cl. 285—16 6 Claims

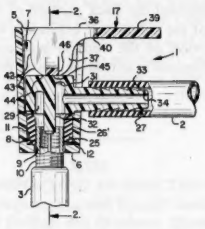


1. A drill collar for a rotary drill string, comprising a drill collar body member, a connection member at one end of said body member having a threaded end adapted for attachment to a companion threaded end of an adjacent portion of the rotary drill string, a first of said members including a pin portion having a conical outer surface, a second of said members including a box portion having a conical inner surface and adapted to receive said pin portion, said conical inner surface matching the configuration of said conical outer surface, one of said members having an external transverse shoulder near the base of the conical outer surface of said pin portion, the end of said box portion confronting said shoulder, a wear sleeve mounted on said pin portion between said shoulder and said end of said box portion, said wear sleeve being engageable by said shoulder and said end of said box portion, said sleeve having a conical inner surface corresponding to and in contact with said conical outer surface, means on one of said members for directing fluid under pressure to the region between said box portion inner surface and conical outer surface to expand said box portion, means on said sleeve for directing fluid under pressure to the region between said sleeve inner surface and conical outer surface to expand said sleeve, whereby expansion of said box portion and sleeve enables said pin portion to be moved relatively longitudinally along said box portion and sleeve to engage said end of said box portion with said sleeve and engage said sleeve with said shoulder to effect securing of said sleeve and box portion to said pin portion by shrink-fit frictional engagement between said sleeve and box portion inner surfaces and conical outer surface upon relieving of the fluid pressure in the regions between said sleeve and box portion inner surfaces and conical outer surface.

3,923,325
COMPRESSION COUPLING

Charles A. Slater, Jr., Leawood, Kans., assignor to Peterson Manufacturing Company, Grandview, Mo.

Filed Oct. 17, 1974, Ser. No. 515,687
Int. Cl.[2] F16L *37/18*
U.S. Cl. 285—312 2 Claims



1. A compression coupling between a supply member and an elongate tubular receiving member comprising:

a. a one piece body member molded of synthetic resin and having a longitudinal bore opening at one end and a reduced aperture at the other end to receive an end portion of an elongate tubular receiving member extending therethrough into said bore, said body member having a shoulder between said aperture and bore, said body member having opposed substantially parallel walls at said one end with aligned opposed bearing recesses therein and another wall between said opposed walls with an elongate slot therein extending from said one end terminating in spaced relation to said shoulder;

b. a compressible sleeve normally fitting in said bore and having an end engaging said shoulder, said sleeve having a through bore normally of a size to movably receive said end portion of said tubular receiving member and contractable to sealingly engage same in response to longitudinal compression;

c. a depressor member molded of synthetic resin and slidably mounted in said bore and having one end engaging said sleeve whereby said sleeve is between said one end of the depressor member and said shoulder, said depressor member having an elongate portion extending outwardly through said slot for connection with a supply member and a passage communicating same with the bore in said sleeve;

d. a one piece actuating member molded of synthetic resin and having a head with a lever extending therefrom and opposed integral bearing members extending laterally outwardly of said head into said bearing recesses in the opposed body walls to pivotally mount said actuating member, a cam member on said actuating member head engaging said depressor member in a released position and operable to move said depressor member longitudinally of said body bore to compress said sleeve in response to pivoting of said actuating member to a compressing position;

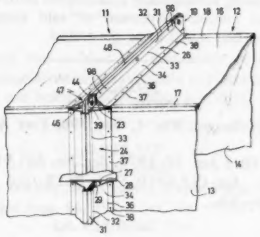
e. said opposed body walls having limited resiliency permitting outward spreading movement thereof for movement of said actuating member bearing members therebetween to alignment with the respective bearing recesses and then return to position said bearing members in said bearing recesses;

f. said bearing members having outer ends with portions bevelled inwardly therefrom forming inclined surfaces for engagement with the opposed body walls to facilitate outward spreading thereof in response to pressure on the actuating member moving same into said one end of the body bore.

3,923,326
FLANGE CONNECTION

Georg Mez, Gartenstrasse 30A, 7416 Gonningen, Germany

Filed Feb. 4, 1974, Ser. No. 439,386
Int. Cl.² F16L *17/00*
U.S. Cl. 285—363 **11 Claims**



1. A flange connection for rectangular air-conditioning ducts comprising

flange means having four sheet metal frame members, said frame members having open hollow sections at the ends of said frame members and sealing surfaces between said open ends adapted to seal against their surface at a sealing plane,

said flange means being adapted to be pushed on the free end of a duct and to be rigidly connected therewith,

metal elbow means several millimeters in width having two legs and a central portion, with a corner area thereon, connected to said legs,

said legs being inserted into the open hollow sections on adjacent ends of said frame members,

said elbow means having spacer means in one piece therewith projecting from the corner area thereof in the direction of said sealing plane, of a material suitable to maintain an adequate effective height when subjected to contact pressures on said elbow means,

the projecting height of said spacer means being adequate to space the corner of said elbow means from the sealing plane to cause the sealing surfaces on the frame members to press towards the sealing plane and maintain them in this position, under contact pressure on said elbow means.

3,923,327
SEALING CAM INTERLOCK

Irving D. Ross, Jr., Barrington, Ill., assignor to The Youngstown Steel Door Co., Cleveland, Ohio

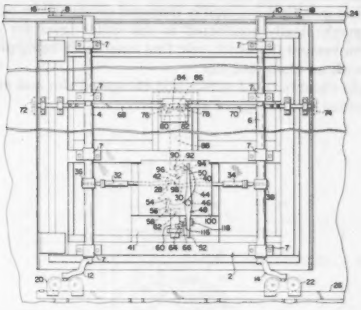
Division of Ser. No. 165,897, July 26, 1971, Pat. No. 3,776,581. This application July 23, 1973, Ser. No. 381,741
Int. Cl.² E05C *1/12*
U.S. Cl. 292—39 **5 Claims**

1. A mechanism for indicating the point at which a handle mounted on a rotatable shaft attains a desired degree of rotation, said mechanism comprising:

a handle position indicating means in the form of an elongated member with a locking surface thereon;

a cam crank responsive to rotational movement of the handle;

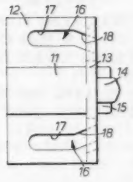
a cam crank activated means in association with said position indicating means for selectively indicating the point at which the desired degree of rotation is attained.



3,923,328
FIXING ARRANGEMENTS

Michael Joseph James, Charlton Kings, England, assignor to Micro & Precision Mouldings (Cheltenham) Limited, Cheltenham, England

Filed Feb. 6, 1974, Ser. No. 440,123
Int. Cl.² E05C *19/02*
U.S. Cl. 292—75 **2 Claims**



1. A component having a fixing plate element with two elongate fixing screw slots which are parallel over portions of their length to allow positional adjustment of the component before, in use, pre-fixed screws received in said slots are fully tightened, the slots being parallel-sided and having open-ended mutually convergent end portions which allow the component to be fitted on the screws one at a time with appropriate angling of the component about the first screw to allow entry of the second screw into the corresponding slot.

3,923,329
DOOR LATCH DEVICE FOR VEHICLES

Nozomu Torii, Hekinan, and Yoshikatsu Furuya, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 6, 1974, Ser. No. 530,424
Claims priority, application Japan, Dec. 24, 1973, 49/2107
Int. Cl.² E05C *3/26*
U.S. Cl. 292—216 **10 Claims**

1. A door latch device for a vehicle comprising in combination:

a latch body;

a latch member rotatably mounted on said latch body;

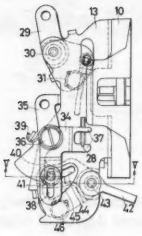
a pawl rotatably mounted on said latch body and engageable with said latch member;

an outer lever operatively connected to said pawl and movable for controlling the rotation thereof;

a locking lever mechanically connected to said outer lever for controlling the movement of said outer lever;

a first inner lever rotatably mounted on said latch body and mechanically connected to said outer lever for unitary movement therewith, said first inner lever being provided with an elongated slot;

a pin slidably fitted within said elongated slot and movable along said elongated slot;



a second inner lever pivotally mounted on said latch body and operatively connected to said pin; and

a "childproof" lever pivotally mounted on said latch body and operatively connected to said pin, said "childproof" lever being movable to an unlocked position wherein said second inner lever is engageable with said pin and to a locked position wherein said second inner lever is out of engagement with said pin.

3,923,330

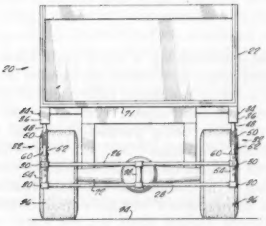
ARTICULATED BUMPER

Charles S. Viall, Sr., 1150D S. State College Blvd., Anaheim, Calif. 92806, and Charles S. Viall, Jr., 3401 Gaviota, Long Beach, Calif. 90008

Filed July 22, 1974, Ser. No. 490,484

Int. Cl.[2] B60R *19/06, 27/00;* **B60T** *7/12;* **B61F** *19/06*

U.S. Cl. 293—4 **20 Claims**



1. In combination with a vehicle having brakes and a tilting bed movable to lower the rearward portion thereof and to raise the forward portion thereof, a safety bumper, comprising:

a. obstacle encountering means for contacting obstructions,

b. at least one support member,

said support member having a resilient flexible portion intermediate first and second regions thereof,

said resilient flexible portion including a spring one end of which is connected to said first region and the other end of which is connected to said second region for allowing relative deflection of said first and second regions,

said obstacle encountering means being attached to said first region,

c. connecting means for pivotally connecting said second region of said support member to said tilting bed of said vehicle so that said support member depends therefrom, said connecting means permitting limited substantially unrestricted pivoting of said second region in one direction relative to said vehicle while precluding further pivoting thereof, and

d. signal generating means for generating a signal when movement of said obstacle encountering means causes a predetermined pivotal movement of said support member in said one direction,

said resilient flexible portion of said support member remaining substantially undeflected until said predetermined pivotal movement of said support member causes said signal to be generated.

3,923,331

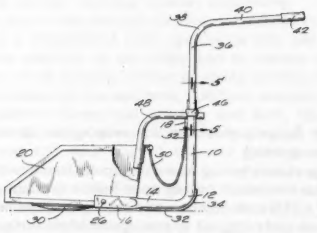
SNOW SCOOP

Arnold A. Hollnagel, Rte. 4, Box 396, Fort Atkinson, Wis. 53538

Filed Jan. 17, 1975, Ser. No. 541,916

Int. Cl.[2] E01H *5/02;* **B62B** *1/16*

U.S. Cl. 294—54 **8 Claims**



1. A snow scoop comprising a frame which includes a curved portion that can be rocked on an underlying surface, a pair of mounting arms extending forwardly from said curved portion, an open ended bucket pivotally connected between said mounting arms on a pivotal axis which lies behind the bucket's center of gravity, whereby rocking of said frame on the curved portion thereof causes said bucket to pivot between a loading position in which snow can be scooped up by said bucket and a dumping position in which snow will be dumped from said bucket, a pair of handles vertically pivotally attached to said frame and pivotable between a rear position and a frontal position, and cooperating latch means attached to said handles and said bucket for latching said bucket in its loading position when said handles are in their rear position and for unlatching said bucket for movement to its dumping position when said handles are moved to their frontal position.

3,923,332

TRANSPLANTER

Atsushi Shirouzu, Minami No. 22, Heiwa-Dori 1-chome, Shiraishi-cho, Sapporo, Hokkaido, Japan

Division of Ser. No. 190,113, Oct. 18, 1971, abandoned. This application Mar. 1, 1973, Ser. No. 337,009

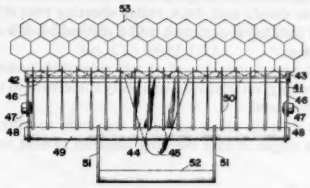
Claims priority, application Japan, Oct. 20, 1970, 45-104417; Apr. 19, 1971, 46-25554

Int. Cl.[2] B66C *1/00*

U.S. Cl. 294—87 R **8 Claims**

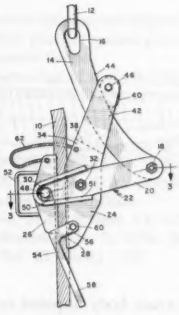
1. A seedling container separating device comprising a frame, an engaging plate provided in front of said frame so as to engage with a plurality of seedling containers, arms connected by shafts to said frame so as to rotate freely about said shafts, a support rod connected to said arms for rotation therewith and a plurality of arcuate needles provided on said support rod for piercing said containers, the arc defined by

each of said needles being coincident with a portion of the circumference of an imaginary circle centered on the axis of



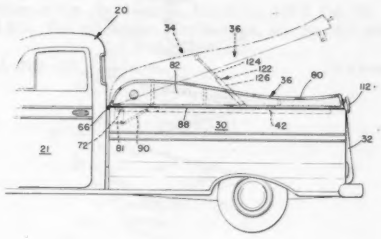
rotation of said rod so that the movement of said needles follows the circumference of said circle to pierce said containers upon said rod being rotated about said axis.

3,923,333
CABLE GRIP
Morris Lamar Whaley, 2605 Faivre, Chula Vista, Calif. 92011
Filed Aug. 16, 1974, Ser. No. 498,027
Int. Cl.² B66C *1/44*
U.S. Cl. 294—104 **3 Claims**



1. A straight line cable grip, comprising:
a pair of similar spaced confronting link bars;
a primary jaw having pivotal mounting means whereby the same is mounted on and between said link bars, and having a cablegripping face;
a secondary jaw having pivotal mounting means comprising opposed trunnion-like projections thereon and said link bars are provided with slots to accept said projections whereby said secondary jaw is releasibly mounted on and between said link bars and has a cable-gripping face in confronting relation to the first mentioned face;
said link bars having lever arms extending from the side thereof remote from said secondary jaw;
a hanger bar pivotally secured to the distal ends of said lever arms;
said primary jaw having a stablilizing arm on the side thereof remote from said secondary jaw and having a sliding connection with said hanger bar;
a grip-releasing cam element mounted on said primary jaw and manually shiftable to force said link bars and said primary jaw to move relatively to each other into a cable-releasing relationship;
said grip-releasing cam element comprises a bar pivoted on said primary jaw and having a knee portion shiftable into camming contact with one of said link bars and locking said link bar relative to said primary jaw in said cable-releasing relationship, whereby when so locked, said secondary jaw is easily removable.

3,923,334
VEHICLE BED COVER ASSEMBLY
Hugh L. Key, 181-A Broadmoor Lane, Winston-Salem, N.C. 27104
Filed Mar. 22, 1974, Ser. No. 448,915
Int. Cl.² B60P *3/42*
U.S. Cl. 296—10 **7 Claims**

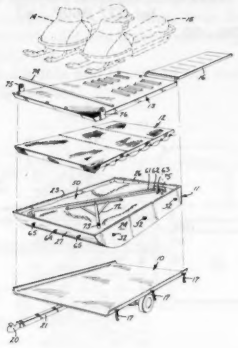


1. A low profile, lightweight cover assembly for a pickup type vehicle having a cargo bed formed by spaced side walls, a forward wall, a tailgate and standard pockets in the upper portion of the side walls, comprising; a cover corresponding substantially in size to the width and length of the vehicle cargo bed, means for permitting pivotable movement of said cover about the cover forward end between opened and closed positions, roller means extending forwardly of said cover for facilitating placement upon and detachment from a vehicle by rolling upon the vehicle side walls, a frame assembly means releasably mounted upon said vehicle without altering the vehicle, wherein said frame assembly means includes a first member supported by the vehicle front wall, spaced side members, and means adjustably positioning said side members relative to said first member for support by the vehicle side walls, and means for releasably, locking said cover to said frame assembly means to prevent access to the cargo bed said releasable locking means including a handle normally overlapping the vehicle tailgate when in locked position to prevent opening of the tailgate, said releasable locking means further including adjustable rod members displaceable into engagement with said frame assembly means to prevent pivoting of said cover, and further including resilient strap tension means for releasably attaching the forward end portion of said cover to the vehicle.

3,923,335
CAMPER UNIT FOR SNOWMOBILE TRAILERS
Jerome A. Erickson, 5816 Decatur Ave. North, New Hope, Minn. 55428
Filed Aug. 22, 1974, Ser. No. 499,439
Int. Cl.² B60P *3/34*
U.S. Cl. 296—23 R **1 Claim**

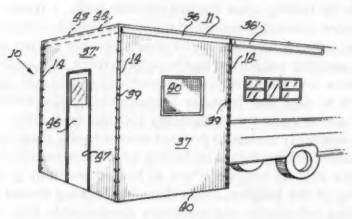
1. A travel accessory comprising in combination:
a wheeled trailer including means for coupling said trailer to be towed by a road vehicle;
a sledge type of camper casing containing a collapsed camper and having an open top, a snow engaging bottom including longitudinally extending runners, and side walls capable of supporting a load;
removable means including a rigid towbar for connecting said casing to be towed over snow by a snowmobile;
means removably securing said casing to said trailer;
a removable travel cover secured over the top of said casing to protect the content thereof;
a removable load bearing deck member carried on said side

walls and extending over said open top;
and a means for removably securing a self-powered vehicle



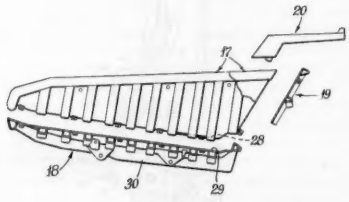
to said deck member for transportation behind the wheel vehicle, on said trailer and above said casing.

3,923,336
TOTE-A-ROOM
Blake R. Price, Sr., P.O. Box 101, Damascus, Va. 24236
Filed Nov. 13, 1974, Ser. No. 523,232
Int. Cl.² B62D *33/08*
U.S. Cl. 296—26 **6 Claims**



1. A tote-a-room enclosure intended for permanent mounting as an accessory item to a truck mounted camper unit, the camper unit having opposed side walls and a vertical back wall, the tote-a-room comprising, in combination:
a pair of identically constructed side roller assemblies
means adapted to mount said side roller assemblies hingedly to opposite top edges of opposite side walls of said camper unit such that each of the side roller assemblies is swingable in a horizontal plane between a storage position disposed in parallel juxtaposition to the associated side walls of the camper, and an operative position projecting rearwardly of said camper rear wall;
a length of flexible sheeting disposed in a coil in each of said side roller assemblies and adapted to be uncoiled therefrom to define side wall portions of said tote-a-room;
a back roller assembly adapted to be mounted across the top edge of said trailer back wall;
a length of flexible sheeting material coiled in said back roller assembly and adapted to be uncoiled therefrom in a manner to define a top and a back wall to said tote-a-room;
a cross-arm assembly pivotally affixed to a portion of each of said side roller assemblies and adapted to be placed in longitudinal alignment with each other interconnecting said side roller assemblies when said side roller assemblies are in said operative position, said operative position of said cross arms being substantially parallel to said trailer back wall;
said cross-arms supporting thereover said back roller sheeting to divide said back roller sheeting into a horizontal roof forming top portion and a vertical back wall forming portion;
rods disposed at each end of said side roller assemblies and extending vertically downwardly therefrom to engage the ground; and
means slidable along said rod members to affix adjacentmost edges of said sheeting material to said rods.

3,923,337
MODULAR TRUCK BODY AND METHOD FOR MAKING THE SAME
Samuel L. Kershaw, and Bernard E. Proeschl, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed May 23, 1974, Ser. No. 472,709
Int. Cl.² B62D *27/00*
U.S. Cl. 296—28 M **7 Claims**

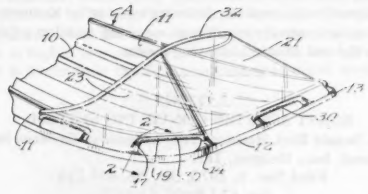


1. A modular truck body disposed on a longitudinal axis thereof comprising
a pair of upstanding and laterally spaced side modules, each having an L-shaped cross section to comprise a generally vertical side section and a generally horizontal bottom section,
a generally horizontal floor module having outer ends thereof secured to respective inner ends of said side modules,
an upstanding front module having outer ends thereof secured between forward ends of said side modules and a lower edge thereof secured to said floor module,
a plurality of longitudinally spaced L-shaped ribs having a U-shaped cross section secured exteriorly on each of said side modules, each rib terminating at an inner end short of the inner end of such side module,
a plurality of transversely disposed and longitudinally spaced beams having a U-shaped cross section secured exteriorly on said bottom module, each beam extending between the inner ends of a pair of said ribs and terminating at outer ends thereof short of the outer ends of said bottom module, and
a connecting member having a U-shaped cross section secured between each outer end of each of said beams and the inner end of a respective rib, wherein the inner end of each of said ribs and the outer end of each of said beams has a recess formed thereon along their entire edge for receiving an end of a respective connecting member therein, and wherein said side modules are further secured together by a plurality of combined alignment and releasable fastening means.

3,923,338
WINDSHIELD FOR SNOW VEHICLE

Cedric C. Sovia, 319 S. Lake St., Forest Lake, Minn. 55025, and Kenneth W. Krengel, 1800 Highland Parkway, St. Paul, Minn. 55116

Filed May 15, 1974, Ser. No. 470,072
Int. Cl.² B60J 1/02
U.S. Cl. 296—84 K 5 Claims



1. A snow vehicle including:
an elongated vehicle body having a rounded forward end,
a flange secured to said rounded forward end and extending downwardly therefrom,
said flange having spaced apertures therethrough,
a flexible cord laced back and forth through said apertures to provide spaced portions of said cord lying outwardly of said flange,
a windshield of flexible transparent material having a lower edge provided with notches spaced generally similarly to said apertures in said flange,
portions of said lower edge of said windshield between said notches engaging between said cord and said flange.

3,923,339
QUICK ATTACHED TRANSPARENT ARMOR WINDOWS

Wilson C. McDonald, Phoenix, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 314,295, Dec. 12, 1972, Pat. No. 3,855,898. This application Mar. 5, 1974, Ser. No. 448,284
Int. Cl.² B60J 1/20
U.S. Cl. 296—95 R 4 Claims

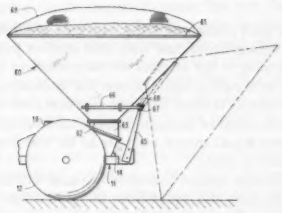
1. A protective panel for the window of a vehicle comprising, a tough bullet residing transparent panel, said panel being positioned on the inside of the vehicle window, an upper window trim strip having a resilient sealing strip, said panel having upper and lower clips for removably securing said panel to said vehicle, said upper clip secured to the panel at its upper edge and extending therefrom and engaging said resilient sealing strip, said upper clip having a contoured portion engaging and seating within said resilient strip, the window in a closed position engaging said contoured portion of said upper clip, said vehicle having a lower window frame, said lower window frame having an upper edge and a flexible sealing strip at the window opening, said lower clip extending downwardly therefrom, said lower clip received between said upper edge of said frame and said flexible sealing strip.

2. A protective panel for a windshield in a vehicle, comprising, a tough bullet proof residing transparent panel positioned on the inside of the windshield, said panel contoured to the windshield shape and having clips secured at the upper edges thereof, a windshield molding member, said clips having a bolt, said bolt secured to said clips by a nut, a screw secured to said bolt, and said screw engaging said molding member.

3,923,340
DEBRIS CONTAINING DEVICE

Charles W. Doering, Clarksville, Ind., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Division of Ser. No. 342,166, March 16, 1973, Pat. No. 3,849,824. This application May 6, 1974, Ser. No. 467,395
Int. Cl.² B60N 1/28
U.S. Cl. 298—10 10 Claims

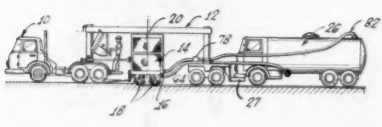


1. A debris containing device for a debris collector having an outlet in a housing defined by an upwardly extending rim through which debris is pushed upwardly by accumulation of debris therebelow comprising a hopper formed of a plurality of walls, said hopper having an opening at its top defined by the upper ends of said walls, said hopper having an opening at its bottom for communication with the outlet in the housing when in a position to receive debris from the outlet in the housing into the bottom of said hopper so that the debris is pushed upwardly into said hopper, said bottom opening being defined by the lower ends of said walls, said hopper having an increasing cross sectional area from said bottom opening to said top opening, and means to pivotally mount said hopper for movement relative to the housing to move said bottom opening in said hopper away from its communication with the outlet in the housing to a position in which debris may fall from said hopper through said top opening of said hopper by gravity.

3,923,341
LIQUID PICK-UP UNIT AND METHOD FOR A PAVEMENT GROOVING MACHINE

Harold C. Miller, Chicago, Ill., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Aug. 16, 1974, Ser. No. 498,234
Int. Cl.² E01C 23/08
U.S. Cl. 299—18 12 Claims



1. A liquid pick-up unit for use with a cutting head assembly for cutting a work surface, the cutting head assembly including a mounting structure, at least one driven rotary cutter rotatably connected to the mounting structure having first and second sides rotating towards, and away from, the work surface, respectively, and a liquid supply member for directing liquid against the first side of the cutter, the liquid pick-up unit comprising:

an enclosure connected to the mounting structure enclosing the cutter, said enclosure having,

an opening facing the work surface through which the cutter projects into engagement with the work surface, a peripheral seal connected with said enclosure in sorrounding spaced relation to the cutter, said seal extending from said enclosure into sliding, sealing contact with the work surface to substantially reduce escape of liquid from said closure,

an outlet communicating with said enclosure facing towards the second side of the cutter positioned to receive liquid mixed with swarf removed from the work surface by the cutter flung centrifugally from the second side of the cutter towards said outlet;

withdrawal means connected to said enclosure for withdrawing the liquid and swarf therefrom through said outlet;

a suction port communicating with said enclosure;

vacuum means connected with said suction port for applying vacuum to the interior of the enclosure to assist said seal in preventing liquid within the enclosure from flowing outwardly thereof between said seal and the pavement the application of vacuum through said suction port causing some liquid mixed with air to be withdrawn through said suction port;

swarf separator means connected to said withdrawal means for separating the liquid from the mixed liquid and swarf withdrawn from said enclosure;

recirculation means connected with said swarf separator means for redirecting the separated liquid against the rotary cutter;

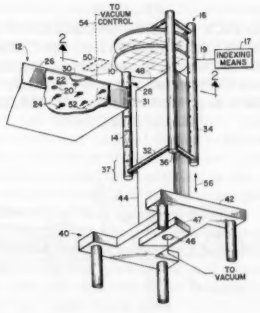
air separator means interposed between and communicating with said vacuum means and said suction port for separating the liquid drawn through said suction port from the air mixed with the liquid; and

conduit means connected with said air separator means for delivering the liquid separated thereby to said swarf separator means.

3,923,342
APPARATUS AND METHOD FOR HANDLING FRANGIBLE OBJECTS

Frank Michael Shannon, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 10, 1974, Ser. No. 477,572
Int. Cl.² B65G *57/11, 51/02*
U.S. Cl. 302—2 R **10 Claims**



1. Apparatus for loading frangible objects comprising:

a. conveying means having an end from which the objects are propelled,

b. a vacuum probe positioned adjacent the end of said conveying means to releasably grasp an object after it has been propelled off the end of said conveying means,

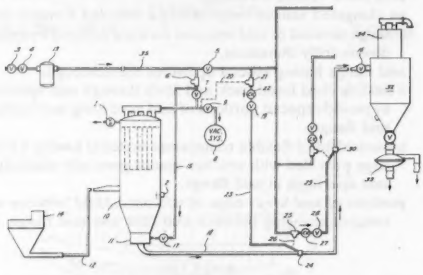
c. a carrier having a plurality of slots each having a back surface into which the objects are to be loaded, said carrier being positioned around said vacuum probe and adjacent to the end of said conveying means, said conveying means terminating prior to entering said carrier, so that said vacuum probe releasably grasps an object after it has been propelled off the end of said conveying means as it moves into one of said slots prior to impact against said back surface, and

d. means for successively indexing said carrier to move said slots successively into object receiving position adjacent to the end of said conveying means.

3,923,343
BOAST ASSISTED CONVEYING SYSTEM

Edwin Donald Bird, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Nov. 9, 1973, Ser. No. 414,298
Int. Cl.² B65G *53/66*
U.S. Cl. 302—24 **2 Claims**



1. A conveying system for conveying a mixture of fluid and particulate matter comprising:

an upstream portion and a downstream portion,

means for causing a mixture of fluid and particulate matter to flow continuously under pressure, through said upstream portion and into and through said downstream portion, and

means for injecting additional fluid into said downstream portion, said injecting means including

sensing means for sensing the pressure in said upstream portion,

a variable opening valve for controlling the amount of fluid injected, and

valve control means operably connected to said sensing means and to said valve, said valve control means including means for opening the valve in response to an increase in the sensed pressure, to further open the valve in response to a further increase in the sensed pressure, and to decrease the valve opening in response to a decrease in the sensed pressure.

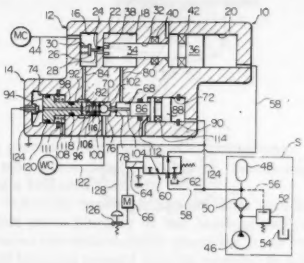
3,923,344
SKID CONTROL ARRANGEMENT OF A AUTOMOTIVE BRAKING SYSTEM

Toshiharu Sekigawa, Atsugi; Yasuhisa Takeuchi, Yokosuka; Masanori Kouda, Atsugi, and Tomoyoshi Sekiguchi, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama and Atsugi Motor Parts Company Limited, Atsugi, both of, Japan

Filed June 11, 1974, Ser. No. 478,261
Claims priority, application Japan, June 13, 1973, 48-65772
Int. Cl.² B60T *8/04*
U.S. Cl. 303—21 AF **14 Claims**

1. A skid control arrangement for use in an automotive vehicle including a master cylinder to produce a braking fluid pressure, a wheel cylinder to receive the braking fluid pressure, a source of an operating fluid pressure having a first

predetermined fixed level and a second predetermined fixed level lower than the first predetermined fixed level, which control arrangement comprises main braking fluid passage means connecting the master cylinder and the wheel cylinder and acted upon by the braking fluid pressure and the operating fluid pressure in relation to one another, the main braking fluid passage means being operative to open for feeding the braking fluid pressure produced at the master cylinder to the wheel cylinder, while being operative to reduce the braking fluid pressure to be supplied to the cylinder for providing a skid control when the operating fluid pressure is at a level which is higher than said first predetermined fixed level or which is lower than the first predetermined fixed level and



higher than a variable level which is predetermined in relation to a given braking fluid pressure, and by-pass braking fluid passage means connecting the master cylinder and wheel cylinder in parallel with the main braking fluid passage means and acted upon by the braking fluid pressure and operating fluid pressure in relation to one another, the by-pass passage means being operative to open for feeding the braking fluid pressure produced at the master cylinder to the wheel cylinder for cancelling the skid control when the operating fluid pressure is at a level which is lower than a second variable level predetermined in relation to the given braking fluid pressure and higher than the first variable level or which is lower than said second predetermined fixed level.

3,923,345

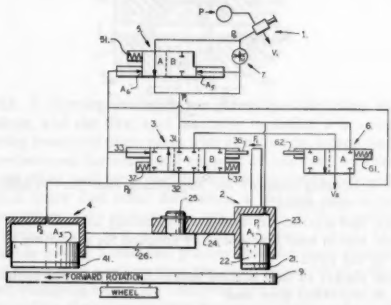
ANTI-SKID BRAKING SYSTEM WITH TORQUE SENSING MEANS

Joseph Louis Poggie, 815 Iris Lane, Vero Beach, Fla. 32960

Filed Oct. 3, 1974, Ser. No. 511,781

Int. Cl.² B60T *8/00*

U.S. Cl. 303—21 CH **16 Claims**



1. An anti-skid brake system comprising in combination:

a. brake pedal means for actuation by an operator;

b. master cylinder means operatively connected to said brake pedal means for actuation of a brake system responsive to actuation of said brake pedal means;

c. a pilot brake means operatively connected to said master cylinder means for actuation by said master cylinder means to apply frictional braking force to resist a rotating wheel, said pilot brake means having at least a portion thereof movably responsive to said rotating wheel when said pilot brake means is resisting the rotation of said wheel;

d. a force balancing main control valve in fluid connection with the master cylinder means, said force balancing main control valve being mechanically operated in one direction by the movement of said pilot brake means as the pilot brake means resists wheel rotation;

e. main brake means operatively connected to said master cylinder means through said force balancing main control valve for actuation thereby by the movement of said force balancing main control valve responsive to the actuation of said pilot brake means to resist the rotation of said wheel whereby said main brake means is responsive to force from said rotating wheel when said pilot brake is actuated to resist the rotation of said wheel, said force balancing main control valve controlling fluid pressure in the main brake means and being operated in opposition to the movement of the pilot brake means by the main brake fluid pressure;

f. a second control valve means in fluid connection with the main brake fluid circuit and the force balancing main control valve assembly being mechanically operated by the movement of the pilot brake as the pilot brake resists wheel rotation when backing up or holding on an upgrade.

3,923,346

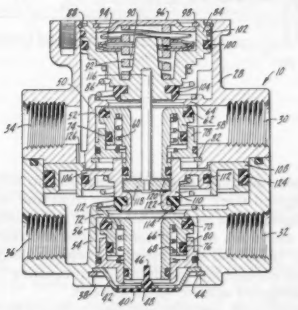
DUAL CIRCUIT BRAKE VALVE

Boleslaw Klimek, Des Plaines, and James W. Ma, Northbrook, both of Ill., assignors to The Berg Manufacturing Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 365,123, May 30, 1973, abandoned. This application Dec. 10, 1973, Ser. No. 423,166

Int. Cl.² B60T *15/06*

U.S. Cl. 303—52 **16 Claims**



1. A brake application valve including a housing having a first inlet and a first outlet, a second inlet and a second outlet and an exhaust outlet, a first shuttle in said housing normally closing communication between said first inlet and outlet, a second shuttle in said housing normally closing communication between said second inlet and outlet, said shuttles normally maintaining communication between said outlets and said exhaust outlet,

a first piston in said housing yieldingly urged away from said first shuttle, a second piston in said housing yieldingly urged away from said second shuttle, mechanical means fixed to said first piston and positioned to cause said second piston to follow inward movement of said first piston, inward movement of both pistons moving said first and second shuttles to open communication between said inlets and outlets and close communication to said exhaust outlet,

said second piston, with said mechanical means being positioned to cause movement thereof, having an outer circumferential surface exposed to fluid pressure at said first outlet to cause movement of said second piston in response to fluid pressures supplied to said first outlet;

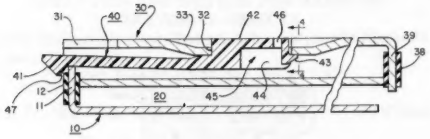
said second piston having an inner portion and an outer portion, with said mechanical means being positioned to cause movement of said inner portion, said outer portion having the circumferential surface exposed to fluid pressure at said first outlet and being mounted in sliding engagement with said inner portion.

3,923,347

SUSPENSION LATCH

Carl J. Dean, Southbridge, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

Filed Oct. 12, 1972, Ser. No. 296,899
Int. Cl.² F16C *17/00*; A47B *88/00*
U.S. Cl. 308—3.6 **8 Claims**



1. Suspension slide apparatus comprising in combination:

an elongated track member having front and rear ends,

an elongated slide member for sliding suspension mounting with said track member having front and rear ends,

the said track and slide members being arranged for fully nested closure and partially nested opening and forming an elongated volume therebetween,

one of said track and slide members having a latching detent mounted thereon and the other of said track and slide members having a latching key mounted thereon for engaging said latching detent to lock said track and slide members in nested closure position against inadvertent opening movement,

and wherein, the latching key has a cantilever mounted resilient key end which is movable laterally in response to and in a direction perpendicular to a longitudinal actuating force while engaging said latching detent to ride over the latching detent during locking and unlocking, and

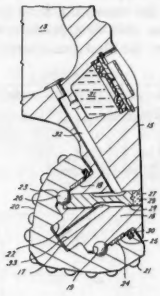
the said latching detent and latching key are located essentially entirely within the said elongated volume.

3,923,348

FRICTION BEARING

James A. Peck, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Mar. 13, 1974, Ser. No. 450,900
Int. Cl.² F16C *19/00*
U.S. Cl. 308—8.2 **5 Claims**



1. A friction bearing having relatively rotatable members including:

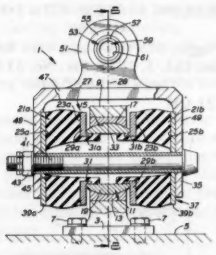
a metallic bushing having a borided inner wear surface.

3,923,349

UNIVERSAL BEARING SUPPORT

Paul T. Herbst, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed June 25, 1973, Ser. No. 373,551
Int. Cl.² F16C *27/00*
U.S. Cl. 308—26 **7 Claims**



1. A bearing support for supporting one part relative to another comprising:

first and second ball-and-socket bearing assemblies,

said ball of said first assembly adapted for mounting to one of the parts,

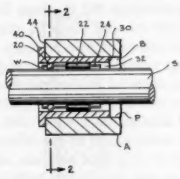
said socket of said second assembly adapted for mounting to the other part, and

means resiliently interconnecting said socket of said first assembly and said ball of said second assembly, said interconnecting means including elastomeric means adapted to deflect in shear to permit relative movement between said balls of the first and second assemblies along an axis passing through the respective centers of both of said balls.

3,923,350
PRECISION BEARING ASSEMBLY

Samuel M. Berry, Dallas, Tex., assignor to Commercial Metals Company, Dallas, Tex.

Filed Mar. 11, 1974, Ser. No. 449,922
Int. Cl.² F16C *19/04*
U.S. Cl. 308—174 3 Claims

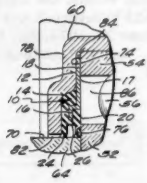


1. A precision bearing assembly comprising:
a. a steel sleeve having an opening therethrough for receiving a ball-roller bearing;
b. a ball-roller bearing having an inner race for receiving a shaft and a plurality of ball bearings and roller bearings spaced circumferentially about the inner race with such ball bearings pressed into the opening in said steel sleeve to provide radial compression on said balls and rollers so as to remove substantially all clearance from said ball-roller bearing, so that deflection under load and end-play of said bearing are substantially eliminated.

3,923,351
INTEGRAL BEARING SEAL

Charles C. Frost, Newaygo, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Sept. 18, 1973, Ser. No. 398,374
Int. Cl.² F16C *1/24*
U.S. Cl. 308—187.1 16 Claims

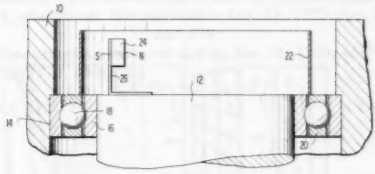


13. A bearing assembly for rotatably supporting wheels, pulleys, and the like, said assembly including a bearing unit having inner and outer races with anti-friction means disposed therebetween for rotational support of one race with respect to the other, said races each having side surfaces and predetermined inner and outer diameters; a bearing seal in sealing engagement with at least one side surface of both said outer and inner race; said bearing seal including a rigid, annular member having a diameter greater than the inner diameter of said outer race and less than the outer diameter of said outer race; clamping means for clamping said rigid member in positive sealing abutment against the one said side surface of said outer race; and an annular, flexible, resilient, wear-resistant member bonded radially inwardly to said rigid member; said flexible member extending radially inwardly from said rigid member into sealing engagement with said inner race, said clamping means, outer race and bearing seal rotating relative said inner race.

3,923,352
BEARING RETAINER STABILIZER

Chester John Pentlicki, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Dec. 6, 1973, Ser. No. 422,382
Int. Cl.² F16C *33/00*
U.S. Cl. 308—191 4 Claims

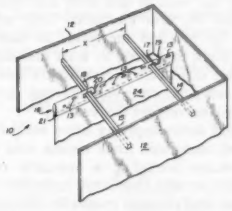


1. In a bearing arrangement between a rotating part and a stationary part wherein said bearing arrangement includes an inner race secured to one of said parts and an outer race secured to the other of said parts and a retaining ring supporting a plurality of rolling elements intermediate said inner and outer races, the improvement comprising magnetic means mounted on said retainer ring and one of said parts for eccentrically loading said retaining ring to suppress instability.

3,923,353
DOCUMENT HANGING APPARATUS

Abram G. Elias, 3300 Skyline Blvd. No. 205, Reno, Nev. 89502, and Peter G. Elias, 6 Wedgewood Drive, Winnipeg, Manitoba, Canada (R3T2J8)

Continuation-in-part of Ser. No. 374,007, June 27, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,890
Int. Cl.² A47B *63/00*; B42F *15/00*
U.S. Cl. 312—184 7 Claims

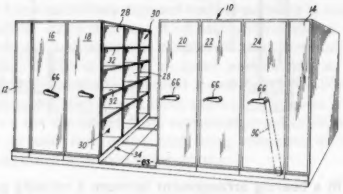


1. Document storage apparatus, comprising:
means forming a compartment for storing documents;
supporting rails disposed within said compartment in parallel relationship to each other;
document hanging means including an elongated strip of flexible material folded in half along its longitudinal centerline to form a document receiving slot, said strip having at least two pairs of elongated apertures provided therein with the apertures of each pair being symmetrically disposed about the fold and with their elongated dimensions aligned parallel to said fold, said strip also having a slit proximate each of said pairs of apertures and extending from the side of one of said apertures most remote from said fold to the most remote side of its paired aperture, said slits forming passageways by which said rails may be inserted into corresponding ones of said apertures; and
means for fastening a document to said strip whereby such document may be removably suspended from said rails by said strip.

3,923,354
ROLLING SHELF SYSTEM

Herbert Young, West Simsbury, Conn., assignor to Kidde Merchandising Equipment Group, South Windsor, Conn.

Continuation of Ser. No. 306,376, Nov. 13, 1974, abandoned.
This application Dec. 23, 1974, Ser. No. 535,802
Int. Cl.[2] A47B *53/00, 49/00*
U.S. Cl. 312—201 8 Claims



1. A rolling shelf system comprising:

a. parallel track means including at least a pair of elongated track members mounted on a surface extending in parallel spaced relationship, said track means including means for adjusting the height of said track members above said surface to dispose the upper surfaces of said track members in a common horizontal plane;

b. an elongated shelf unit overlying said parellel track means and extending transversely of said track members, said pair of elongated track members being disposed adjacent the ends of said shelf unit;

c. carriage means having a length spanning said pair of track members and underlying said shelf unit to provide rolling support for said shelf unit on said track members, said carriage means including an elongated axle having a length extending between said pair of track members adjacent the ends of said shelf unit and a pair of wheels supported on said elongated axle adjacent the ends thereof for rotation therewith on said pair of parallel spaced track members, at least one other axle and one other pair of wheels supported on said carriage means, said wheels supporting said carriage means on said track means for movement therealong;

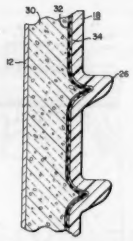
d. a manual force applying drive means for moving said shelf unit along said track means, said manual force applying means including a manually rotatable member supported on said shelf unit, rotatable drive means supported on said carriage means for rotating simultaneously said elongated axle and both of said wheels supported thereof adjacent the ends thereof, chain means connecting said rotatable member and said rotatable drive means for transmitting rotation of said rotatable member into rotation of said rotatable drive means to rotate said elongated axle and wheels thereon to cause movement of said carriage means and said shelf unit along said track means and adjustment means operable for adjusting the tension of said chain means to maintain a predetermined amount of tension on said chain means, said adjustment means including means for varying the vertical spacing between said manually rotatable member on said shelf unit and said rotatable drive means on said carriage means; and

e. floor panel support means comprising support mounting means on the sidewalls of said track members and spaced along the length thereof, floor panel supports engaged with said support mounting means on the sidewalls of said track members and having a horizontally extending portion for seating floor panels thereon to provide a floor surface between said track members, said floor panel support means being movable vertically upon vertical adjustment of the height of said track members.

3,923,355
CABINET CONSTRUCTION FOR A REFRIGERATOR

Charles W. Dietterich, Columbus, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed June 14, 1974, Ser. No. 479,971
Int. Cl.[2] A47B *81/00*; B65D *25/18*
U.S. Cl. 312—214 9 Claims



1. A refrigerator cabinet having a laminated wall construction including an outer metal layer, an inner plastic layer having predetermined areas therein susceptible to stress concentration when said plastic layer is subjected to tensioning forces, an intermediate core of foamed insulation adherent to one of said layers substantially throughout the interface between said insulation and said one of said layers,

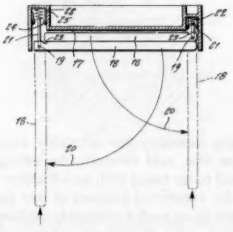
a coating of a release agent interposed between said insulation and the other of said layers in predetermined areas generally coextensive with at least certain of said areas susceptible to stress concentration and,

a coating of an elastomeric adhesive interposed between said insulation and said other of said layers substantially throughout the extent of at least the remaining interface of said insulation and said other of said layers whereby limited movement of said other of said layers with respect to said insulation is permitted.

3,923,356
PORTABLE WORK OR DISPLAY TABLE

P. J. Washburne, 655 Valleybrook Ave., Wabash, Ind. 47591

Filed June 20, 1974, Ser. No. 481,301
Int. Cl.[2] A47B *3/10*
U.S. Cl. 312—241 4 Claims



1. A portable work or display table comprising a case having a bottom wall and side walls mutually defining a generally rectangular compartment, a cover hinged to one of said side walls for closing said compartment, said bottom wall having a pair of elongated, spaced, parallel slots formed therein respectively communicating with said compartment and respectively parallel with and adjacent opposite ones of side wall, first and second pairs of leg members each having upper and lower ends, means for pivotally mounting said first pair of leg members respectively adjacent their upper ends on one of said opposite side walls, the legs of said first pair being respectively pivotally mounted adjacent opposite ends of the respective

one slot, means for pivotally mounting the second pair of leg members respectively adjacent their upper ends on the other of said opposite side walls, the legs of said second pair being respectively pivotally mounted adjacent opposite ends of the other slot, the leg members of each pair being pivotally movable through the respective slot between a stored position in said compartment with one leg of the pair substantially closing the respective slot and being generally flush with said bottom wall, and an extended position for supporting said case as a table, the leg members of each pair in the stored position thereof extending in opposite directions and being in parallel, vertically overlapped relation with respect to said cover and bottom wall, said mounting means for each said leg member comprising a pin slidably received in a slot in the respective one of said opposite side walls, each of said last-named slots being generally perpendicular to said bottom wall and having lower and upper ends, each of said pins being adjacent said lower end of the respective last-named slot in the stored position and adjacent the upper end in the extended position of the respective leg member, said case having four parallel, vertical extending openings formed therein, said openings being respectively adjacent the ends of said first-named slots, the upper end of each said last-named slot extending into a respective opening, said upper ends of each of said leg members in the extended position thereof being received in a respective opening and being held thereby against collapse.

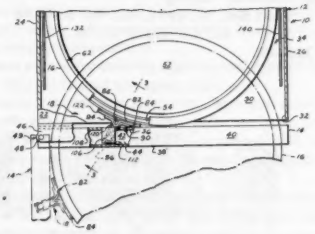
3,923,357
ALTERNATIVELY-MOUNTED COMPACTOR DOOR ARRANGEMENT

William A. Eckerle, and Lauren W. Guth, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed June 5, 1974, Ser. No. 476,527

Int. Cl.[2] A47B *77/10, 77/18, 96/16;* **E05D** *7/02*

U.S. Cl. 312—274 **10 Claims**



1. A domestic refuse compactor comprising:

a frame having a back, first and second spaced sides and an open front defining a refuse compacting chamber;

a door pivotally mounted to the frame for movement between a closed position and an open position;

means for alternatively pivotally mounting the door to the frame about a vertical axis adjacent either side of said first and second spaced sides of the frame;

a receptacle movable between a compacting position within said compacting chamber and a loading position at least partly outside said compacting chamber; and

receptacle mounting means mounting said receptacle on said door, said mounting means having (1) standard means pivotally mounted to said door in spaced relationship to the pivotal mounting means of said door and (2) corresponding means associated with said receptacle, said standard means being symmetrical about a horizontal midplane to receive said corresponding means of said receptacle in both its upright and inverted positions, thereby removably securing said refuse receptacle to said door irrespective of which side of the frame the door is pivoted.

3,923,358
METHOD FOR MANUFACTURING AN IMAGE PICKUP TUBE

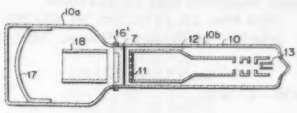
Shoichi Miyashiro, Yokohama; Shunji Shirouzu, Ayase; Kazuo Shimizu, and Okio Yoshida, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 329,576, Feb. 5, 1973, abandoned, which is a division of Ser. No. 105,823, Jan. 12, 1971, abandoned. This application Oct. 18, 1973, Ser. No. 407,579

Claims priority, application Japan, Jan. 16, 1970, 45-3798; July 28, 1970, 45-65546

Int. Cl.[2] H01J *9/18*

U.S. Cl. 316—19 **4 Claims**



1. A method for manufacturing an image pickup tube comprising steps of:

fabricating a semiconductor target including preparing a semiconductor substrate having one conductivity type, forming a plurality of island regions of the opposite conductivity type on one side of the substrate, forming an insulating layer on said one side of the substrate exclusive of the island regions thereof, and coating a semi-insulating layer of cadmium telluride at least on the insulating layer;

mounting said semiconductor target in a glass envelope; and then heating the envelope at a temperature of from 250° to 400°C for evacuation.

3,923,359
MULTI-LAYER PRINTED-CIRCUIT BOARDS

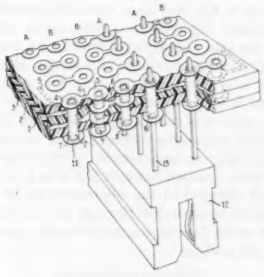
William Newsam, Bournemouth, England, assignor to Pressey Handel und Investments A.G., Zug, Switzerland

Filed July 10, 1972, Ser. No. 270,400

Claims priority, application United Kingdom, July 9, 1971, 32251/71

Int. Cl.[2] H05K *1/07*

U.S. Cl. 339—17 M **3 Claims**



2. A back-plane for a plurality of plug-in functional units comprising, in combination, a multi-layer printed circuit board having plated-through holes and at least one plug-in functional unit provided with socket connectors mounted on a surface of said printed circuit board, each member of a first plurality of said plated-though holes being connected to at least one printed conductor element, each of said at least one printed conductor elements directly extending within said printed circuit board to another plated-through hole of said

first plurality, each member of a second plurality of said plated-through holes comprising a female socket, a terminal tag of a said socket connector being housed therein and operatively connected thereto, each plated-through hole of said second plurality being connected to an adjacent plated-through hole of said first plurality only by a severable linking track, having a straight path comprising a printed conductor element located on that surface of said printed circuit board from which respective ends of terminal tags protrude.

3,923,360

MULTILAYER ELECTRICAL CONNECTION PANEL WITH MODIFIABLE INTERNAL CIRCUITS

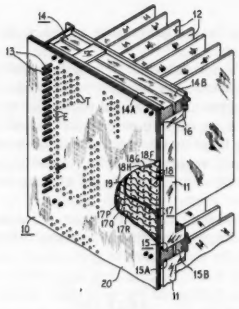
Maurice Pierre Constant Rougon, Bondy, and Gerald Albert Edmond Davy, Noisy-e-Rol, both of France, assignors to Compagnie Honeywell Bull, Paris, France

Filed Mar. 22, 1974, Ser. No. 453,901

Claims priority, application France, Mar. 26, 1973, 73.10766

Int. Cl.² H05K *1/04*

U.S. Cl. 339—17 R **12 Claims**



1. An electrical connection panel comprising two parallel conductive plates and a layer of conductors which is sandwiched between these plates and isolated from them by means of layers of an insulating material, the connections between the conductors of this layer, the said plates, and connectors external to the panel being produced by means of metal-lined holes extending through the panel, these metal-lined holes being arranged in regularly spaced rows and columns, each of the conductors in the said layer extending across a section of the layer situated between two consecutive rows of metal-lined holes, the said connection panel being characterised in that, the outer face of one of the conductive plates is assumed to be divided into elementary areas by the rows and columns of metal-lined holes, each of the areas situated between the columns the respective positions of which are $2n$ and $2n + 1$, when n assumes successive whole-number values, is provided with a circular depression arranged perpendicular to the section of conductor situated beneath this area in order to enable a drilling tool engaged in the depression to be correctly located and guided so as to drill through and cut the said section of conductor when the electrical connection provided by this section is to be broken.

3,923,361

ELECTRICAL CONNECTOR AND CIRCUIT BOARD MOUNTING SYSTEM

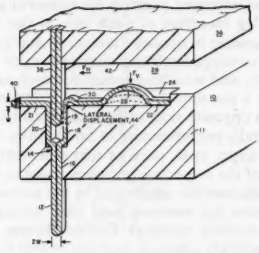
Harold Rosen, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sept. 5, 1974, Ser. No. 503,216

Int. Cl.² H01R *13/28*

U.S. Cl. 339—47 R **30 Claims**

1. An electrical connector comprising: a housing and an electrically conductive spring member, said spring member folded on itself to provide a pin and separated from itself to form a socket, one portion of the spring member forming a laterally deflectible wall of said socket and including an extension having a bent portion, said spring member being mounted



in said housing with said pin extending from one surface of said housing, said bent portion extending above a second surface of said housing and means for deflecting said one portion upon towards an opposite wall of said socket upon depression of said bent portion.

3,923,362

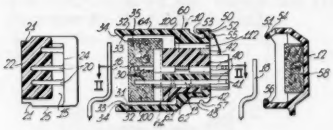
WIRE CONNECTING BLOCKS

Robert Brian Dunn, and James Edward Butler, both of Ottawa, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Dec. 19, 1974, Ser. No. 534,194

Int. Cl.² H01R *13/38*

U.S. Cl. 339—96 **6 Claims**



1. A wire connector block comprising:

a base, said base including a plurality of recesses for the reception of conductors, a conductor in each recess;

a module adapted to clip-on said base;

a plurality of contact clips in said module, a contact clip for each recess, a rear end of each contact clip extending from a back face of said module and positioned to enter a related recess and electrically engage with the conductor in the recess;

a front end of each contact clip extending adjacent to a front face of said module and adapted to receive a further conductor;

a clip-on cover adapted to fit on said front face of said module;

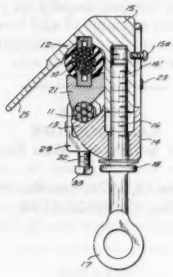
a compressible pad in a recess at said back face of said module, and a compressible pad in said cover and adapted to engage said other ends of said contact clips, said pads containing a sealant, said sealant encasing the connections between conductors and contact clips on assembly of the connector block.

3,923,363

HOT LINE CONNECTOR

Russell H. Kraft, Hopewell Junction, N.Y., assignor to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y.

Filed Aug. 16, 1974, Ser. No. 497,894
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—97 R 1 Claim



1. In a connector assembly for attaching a tap-off conductor to an insulation sheathed high voltage line of the type including upper and lower clamping jaws and first attachment means connecting said upper and lower jaws with said upper jaw shiftable toward and away from said lower jaw and first shifting means forming a part of said first attachment means for shifting said upper jaw toward and away from said lower jaw that improvement comprising:

alignment means for initially aligning said tap-off conductor with respect to said clamping jaws;

a conductor spacer bar supported between said jaws and shiftable therebetween which conductor bar is detachably affixed to the assembly and is provided with insulation piercing teeth positioned to pierce the insulation of the high voltage line;

said alignment means including a lateral extension on each side of said lower jaw, which lower jaw and said lateral extensions provide an elongated seat for the tap-off conductor extending beneath the conductor bar;

tap conductor clamps shaped to receive the said lateral extensions and the tap-off conductor and having means for fastening said tap-off conductor to said assembly with said tap-off conductor held on each side of said lower jaw and beneath said conductor bar;

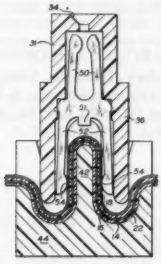
whereby said assembly can be attached to said high voltage line with said high voltage line between said upper jaw and said conductor bar and said upper and lower jaws can be brought toward each other by said first shifting means with said high voltage line and said tap-off conductor engaging said conductor bar in clamped relation with the teeth of the conductor bar piercing the insulation of the high voltage line and the tap-off conductor engaging said conductor bar in clamped relation to form a full contact electrical connection between the high voltage line and tap-off conductor; and said insulation piercing teeth made of a hardness less than that of the strands of the high voltage line to allow the teeth to pierce the insulation sheath of the high voltage line and mushroom under pressure against the said strands to make a flattened, full contact, adequate electrical connection between the conductor bar and the high voltage line.

3,923,364

SHIELDED FLEXIBLE CONDUCTOR CABLE AND ASSEMBLY THEREOF

Jonas M. Shapiro, Stamford, and Maurice Zetena, Darien, both of Conn., assignors to Executone, Inc., Long Island City, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,465
Int. Cl.[2] H01R *23/04*
U.S. Cl. 339—176 MF 19 Claims



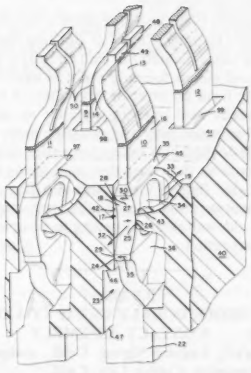
1. Flat, flexible conductor cable comprising a first conductor layer forming a ground shield having an insulating layer on one side thereof with a series of spaced-apart, individual, longitudinal conductors on the insulating layer, said one side of the layer having an exposed portion extending in the longitudinal direction between the individual conductors which is free of said insulating layer and said individual conductors.

3,923,365

PRESS FITTED TERMINAL POST

James Edward Lynch, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 5, 1974, Ser. No. 521,020
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—221 R 9 Claims



1. In a terminal constructed to be frictionally secured in a securing body within an aperture defined by walls to have a rectangular cross-sectional area, and having an upper terminal portion, and a lower terminal portion, an aperture wall-engaging portion connecting said upper portion to said lower portion and positioned within said aperture, and comprising:

first and second substantially parallel beam members spaced apart and each secured at its two ends to said first and second terminal portions of said terminal;

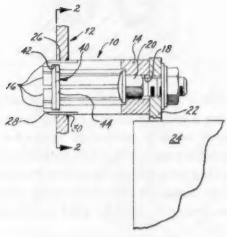
said first and second beams each being bowed in a first direction towards a first wall of said aperture an amount to place said beams in a spring compression force between the two opposing walls of said aperture including said first wall; and

said first and second beams further being bowed outwardly in opposite directions from one another by an amount to exert a spring compression force between the two remaining walls of said aperture.

3,923,366
STAB ELECTRICAL CONNECTOR

William Francis Olashaw, Plainville, Conn., assignor to General Electric Company, Schenectady, N.Y.

Filed June 19, 1974, Ser. No. 480,714
Int. Cl.² H01R 13/16
U.S. Cl. 339—252 P 5 Claims



1. An electrical stab connector comprising, in combination:

A. a plug connector part having

1. a base,
2. a plurality of individual, elongated fingers integrally formed with said base, said fingers arranged in a circular array and extending longitudinally in angularly spaced, parallel relation, and
3. means formed in said base facilitating mounting and electrical connection of said plug connector part to a current carrying part;

B. an essentially plate-like receptacle connector part having first means forming a circular opening therein conforming to the outer diameter of said circularly arrayed fingers and second means forming a slot in said receptacle part extending from an exterior edge thereof into said opening, whereby said opening expands as said fingers are inserted en masse into said opening; and

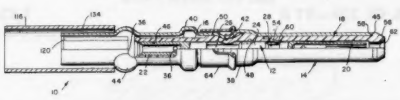
C. a double looped coil expansion spring with one loop of larger diameter than the other, said spring disposed internally of said fingers for urging said fingers individually radially outward into electrically contacting engagement with the sidewall of said opening to complete a stab electrical connection.

3,923,367
SIMULTANEOUS DOUBLE CRIMP COAXIAL CABLE CONTACT ASSEMBLY

David P. Carter, Laguna Niguel, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 8, 1974, Ser. No. 468,041
Int. Cl.² H01R 11/08
U.S. Cl. 339—276 R 22 Claims

2. A coaxial electrical contact assembly having an axis comprising a housing of electrically conductive material having an inner surface, a contact therein having an outer surface, said inner and outer surfaces having substantially the same radial spacing therebetween along the axis, means for defining insulation of deformable plasticity between said housing and said contact, and means for imparting a plastic deformation of substantially uniform wall separation between said inner and outer surfaces, and for securing said insulation means between

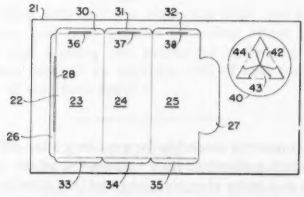


said housing and said contact, thereby for providing a stable, strong and interlocked assembly of said housing, said contact and said insulation means, and for establishing a substantially uniform dielectric constant along the axis.

3,923,368
KALEIDOSCOPE

Jon M. Hassel, Apt. A-929, 463 West St., New York, N.Y. 10014

Filed June 12, 1974, Ser. No. 478,591
Int. Cl.² G02B 27/08
U.S. Cl. 350—4 1 Claim



1. A kaleidoscope for viewing a graphic work, said kaleidoscope being assembled from a single blank of sheet material having a reflective surface, said kaleidoscope comprising, in combination, a center panel and two endmost panels die cut from said blank and foldably joined side by side, said panels being folded to form a prismatic body having three reflective surfaces at 60° to each other within said body, one of said endmost panels having a side tab containing a slit and the other of said endmost panels having a grip tab which passes through said slit in assembly joining said endmost panels and projects outward from the panels to form a handle for said kaleidoscope, a rounded eye piece die cut from said blank containing a triangular opening of the same size as the end of said body to which said eye piece is attached, end flaps of said panels containing slits, said end flaps being folded outward from the end of said body to which said eye piece is attached, and three eye piece tabs extending inward from the sides of said triangular opening, said eye piece tabs being folded and inserted through the slits in said end flaps securing said eye piece to said body.

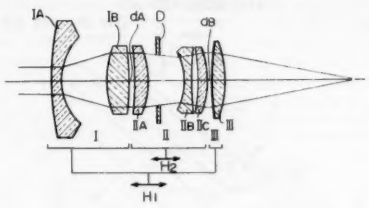
3,923,369
RETROFOCUS TYPE OF OBJECTIVE LENS

Akiyoshi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1974, Ser. No. 446,545
Claims priority, application Japan, Feb. 27, 1973, 48-22712
Int. Cl.² G02B 9/00, 7/02
U.S. Cl. 350—214 8 Claims

1. A retrofocus objective lens comprising a front lens group including a rear positive lens, a rear lens group including a rearmost lens, an intermediate lens group disposed between and axially spaced from said front and rear lens groups including a front positive lens delineating with said front lens group rear positive lens, a first intergroup air space, and a rear positive lens delineating with said rear group rearmost positive

lens a second intergroup air space, said intermediate lens group further including a diaphragm disposed at the back of said front lens of the intermediate lens group, the distance between said front and rear lens groups being fixed, and means for concurrently axially moving said front and rear lens

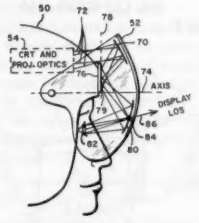


groups as a unit and said intermediate lens group at a rate different from that of said front and rear lens groups to thereby vary the axial dimensions of said intergroup air spaces and compensate for the aggravation of aberration attendant to changes in the focus of said objective lens.

3,923,370
HEAD MOUNTED DISPLAYS

Richard N. Mostrom, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 15, 1974, Ser. No. 514,512
Int. Cl.² G02B *17/00*
U.S. Cl. 350—55 **8 Claims**



1. In a display apparatus for use with headgear having a visor with at least two partially reflective areas thereon which are part of a paraboloid having an axis of rotation;

means for producing an image;

optical means for projecting light from said means to a first of the two areas on the visor for reflection therefrom to a reflecting surface on the headgear and for reflection therefrom to the second of the two areas on the visor so as to form the desired image for viewing by the wearer, the improvement comprising mounting the optical means and the reflecting areas asymmetrically about the axis such that a line drawn from the eye of the wearer to the center of the aperture of the second of the two areas is at a raised angle with respect to a line drawn from the eye of the wearer parallel to the axis.

3,923,371
OPTICAL FIBRE CONNECTORS

Jack Frank Dalgleish, Ottawa, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Mar. 22, 1974, Ser. No. 453,593
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 C **3 Claims**

1. A connector for releasably connecting a plurality of independent pairs of coated optical fibres, each fibre of a pair in accurate abutting end-to-end alignment with the other fibre of a pair, comprising:

a first housing;

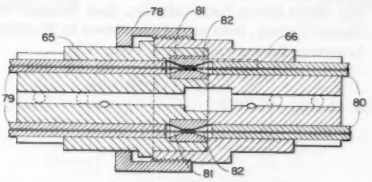
a plurality of bores extending axially through said first housing, said bores each including a small diameter portion adjacent a forward end of said housing, said small diameter portion of a diameter to fit closely on an uncoated end of a fibre, the remaining portion of each bore of a larger diameter to receive a coated portion of the fibre;

a plurality of first convergent surfaces at said forward end of said housing, a convergent surface extending from the surface of said forward end to each of said small diameter portions of said bores;

a plurality of second convergent surfaces, a convergent surface extending from said larger diameter portion of each of said bores to the related small diameter portion of the bore;

a second housing;

a plurality of bores extending axially through said second housing, each bore of a uniform diameter to receive a



coated fibre with an uncoated end extending from a forward end of said second housing;

cooperating formations in said first and second housings for aligning said housings in a predetermined relative position;

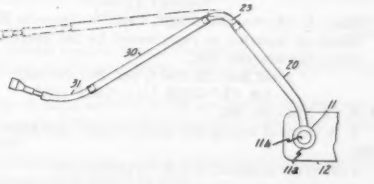
and retaining means on one of said housings in engagement with means on the other of said housing, for retaining said first and second housings in engagement with said forward end of said first housing in face to face abutting relationship with a forward end of said second housing and each bore in said first housing in axial alignment with a bore in said second housing,

whereby the uncoated ends of the fibres extending from said second housing are guided by said first convergent surfaces in said first housing into abutting end-to-end alignment with the uncoated ends of the corresponding fibre of each pair located in the small diameter portion of the first housing bores.

3,923,372
FIBER OPTIC EXTRA ORAL OPERATORY LIGHT

Max Roland, Redwood City, Calif., assignor to MDT Instrument Company, Gardena, Calif.

Continuation-in-part of Ser. No. 204,995, Dec. 6, 1971, abandoned. This application Jan. 4, 1974, Ser. No. 430,759
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 B **7 Claims**



1. An extra oral operatory light comprising:

a fiber optic bundle with a proximal end connected to a housing and adapted to receive light from a light source

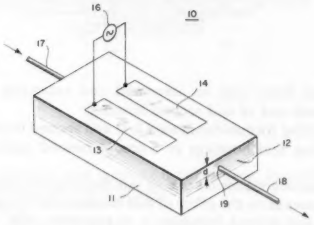
within said housing, and a distal end connected to a light fixture and adapted to transmit light to said light fixture; a conduit, housing said fiber optic bundle, including a first, relatively short, flexible segment with a distal end connected to said light fixture, a second relatively long, rigid segment with a proximal end connected to said housing, and alternate relatively long, rigid segments and relatively short, flexible segments between said first and second segments, each of said rigid segments being lighter in weight per unit length than said flexible segments; and a coupling constituting means for connecting the proximal end of said second segment to said housing and structured to permit movement of the proximal end of said bundle in an arc around light source without distorting the bundle.

3,923,373

COUPLING TO GRADED INDEX WAVEGUIDE

Franklin Winston Dabby, Ewing Township, Mercer County, and David Harry Smithgall, Sr., East Windsor Township, Mercer County, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed July 1, 1974, Ser. No. 485,048
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 WG **8 Claims**



1. A mode-selective optical device, which comprises:

a planar waveguide comprising a transparent dielectric member having a graded index of refraction near one surface thereof to render said waveguide capable of supporting different propagation modes at different distances from said surface; and

means for coupling optical energy of a selected one of said propagation modes into or out of said waveguide, said coupling means being physically positioned proximate one end of said waveguide, the optical axis of said coupling means being spaced a distance from said surface such that said coupling means couples into the region of said waveguide capable of supporting essentially only said selected mode.

3,923,374

HIGH SPEED ELECTRO-OPTIC WAVEGUIDE MODULATOR

William E. Martin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 22, 1974, Ser. No. 490,461
Int. Cl.² G02B 5/14; G02F 1/03
U.S. Cl. 350—96 WG **9 Claims**

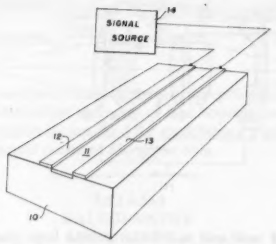
1. A channel waveguide electro-optic modulator comprising:

a substrate material of a II–VI compound;

an optical waveguide having a predetermined uniform width defined by a channel of diffusant in a portion of said substrate material,

said diffusant being an element chosen from the groups II and VI of the periodic table of elements;

an electrical conductor of predetermined uniform width disposed proximate to and parallel with each side of said channel of diffusant, the ratio of the width of said optical waveguide to the width of each said electrical conductor being substantially of the order of 2:1; and



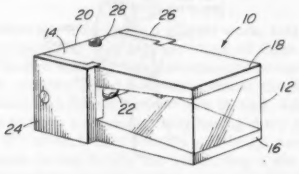
a source of electrical signals connectable to said electrical conductors and developing an electric field across said optical waveguide for modulating light energy passing therethrough by changes in refractive index commensurate with said electrical signals.

3,923,375

WEDGE REFLECTOR FOR FIBER OPTIC BUNDLE

Edwin R. Bowerman, Topsfield, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed July 24, 1974, Ser. No. 491,592
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C **4 Claims**



1. A wedge reflector for increasing the intensity of light in central portions of a normally truncated conical output beam of light from a fiber optic bundle, the wedge reflector comprising

a holding member having an entrance portion through which a centrally located bore extends for slidably receiving the fiber optic bundle therein; the fiber optic bundle extending throughout the length of the bore and terminating at a first face of the holding member so that a normally truncated conical beam of light from the fiber optic bundle emanates from the first face of the holding member,

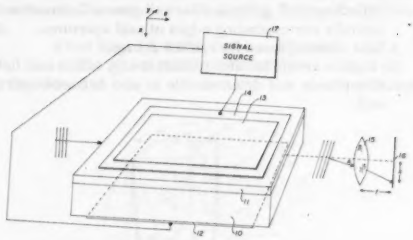
means for securing the fiber optic bundle in the holding member, and

a pair of divergent, essentially planar internally reflective surfaces affixed to the holding member, the reflective surfaces intersecting the first face on the holding member on opposite sides of the bore, at approximately identical angles, and along a pair of parallel lines which are separated by the width of the bore so that the axis of the truncated conical beam of light bisects the angle between the pair of divergent, essentially planar, internally reflective surfaces, the divergence of the reflective surfaces being selected so that outer portions of the normally truncated conical beam are folded back over substantially the full width of the central portions of the beam thereby increasing the intensity of the beam in the central portions thereof.

3,923,376
ELECTRO-OPTIC WAVEGUIDE BEAM DEFLECTOR

William E. Martin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1974, Ser. No. 494,132
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 WG 7 Claims

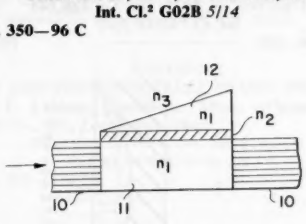


1. An optical beam deflector comprising:
an electrically conductive substrate;
a multi-mode optical waveguide of electro-optic crystal material supported by said substrate for transmitting polarized light energy along a determinable path,
said electro-optic crystal material having a gradient variation in electrical resistivity as a function of depth within its thickness;
a top and bottom electrode disposed with said electro optic crystal material therebetween; and
a source of electrical potential arranged to be connected to said top and bottom electrode for generating an electric field having a gradient variation commensurate with said gradient variation in electrical resistivity causing a gradient variation in refractive index relative to said thickness for changing the orientation of the plane wave of said light energy responsive to the instantaneous value of said electrical potential.

3,923,377
HIGH ANGLE OPTICAL RAY SEPARATOR

A. Fenner Milton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,516
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C 6 Claims

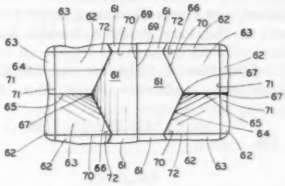


1. An optical connector for separating optical radiation traveling in a multimode fiber bundle transmission line at a large angle to the axis of said fiber bundle from the optical rays which have propagation close to the axis; which comprises:
a dielectric rod of optical radiation transparent material having an index of refraction of n_1, which is connected into a separation in a main optical fiber bundle transmission line with its input end adjacent the output end of said separated fiber bundle transmission line and with its output end adjacent the input end of said separated fiber optic transmission line and having the same cross sectional area as said main transmission line,
a thin layer of optical transparent material on one surface of said dielectric rod and having an index of refraction of n_2, where n_2 is less than n_1;
at least one tapered slab of optical material secured onto said thin layer of optical material and having an index of refraction of n_1;
said tapered slab positioned with the angle of incline increasing in the direction of radiation propagation in said main transmission line.

3,923,378
CUBE-CORNER REFLECTOR WITH NON-ALIGNED CUBE AXES AND ELEMENT AXES

Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Corporation, New York, N.Y.

Filed Apr. 24, 1973, Ser. No. 354,153
Int. Cl.² G02B 5/12
U.S. Cl. 350—103 34 Claims



1. A retrodirective reflector for reflecting light substantially back to the source thereof, said reflector comprising a body of transparent material having a light-receiving front face, and a plurality of retrodirective cube-corner reflector elements at the rear of said body, each of said reflector elements having an element axis and a cube axis, each of said reflector elements having an outline in the shape of a regular polygon when projected in a plane perpendicular to said element axis, each of said reflector elements having three mutually perpendicular faces symmetrically arranged with respect to said cube axis and respectively intersecting in three mutually perpendicular edges, the element axes respectively of all of said reflector elements being disposed substantially parallel to one another, the cube axes of at least some of said reflector elements being inclined with respect to the associated element axes at a predetermined angle other than zero degrees.

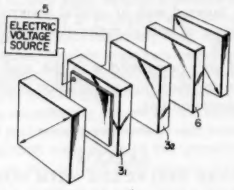
3,923,379
LIGHT CONTROL ELEMENT HAVING A WIDE VIEWING ANGLE

Akio Kumada, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed July 30, 1974, Ser. No. 493,103
Claims priority, application Japan, July 30, 1973, 48-84907
Int. Cl.² G02F 1/03
U.S. Cl. 350—150 11 Claims

1. An optical control device comprising:
first and second biaxial electro-optic crystals, each of which has
a pair of major surfaces which are normal to a bisector of an angle defined by the two optical axes of the crystal, and
a thickness providing a retardation equal to that provided by the other biaxial crystal;
at least one pair of transparent electrodes provided respectively on the pair of major surfaces of at least one of said biaxial crystals, and a respective source of supply voltage connected to each respective pair of electrodes; and

a uniaxial crystal plate, which is conjugate to said first and second biaxial crystal plates, having a thickness corresponding to the equivalent retardation of said biaxial crystal plate;



said biaxial crystal plates and said uniaxial crystal plate being disposed optically in cascade with each other.

3,923,380

ELECTROOPTIC MODULATOR UTILIZING MULTIPLE INTERFERENCE

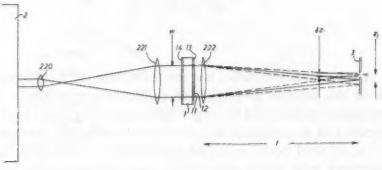
Shuzo Hattori, and Tadao Hiramatsu, both of Nagoya, Japan, assignors to Hagiwara Denki Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 8, 1974, Ser. No. 449,522

Claims priority, application Japan, Mar. 12, 1973, 48-28825

Int. Cl.² G02F *1/32, 1/38*

U.S. Cl. 350—160 R **4 Claims**



1. An electrooptic modulator comprising:

An electrooptic ferroelectric crystal of 3*m* symmetry having first and second polished plane surfaces defined by rectangular coordinate first and second axes and parallel to each other within one part in one hundredth of an optical wavelength, the crystal c-axis of said crystal being parallel to said first axis;

First and second partially transmitting dielectric multilayer reflecting films integrally deposited on said first and second plane surfaces respectively;

Electrodes provided on said first film to cause in said crystal and subjacent said first film an electrostatic field which is spatially periodic in a direction of said first axis and uniform in a direction of said second axis;

A first means to apply to said electrodes a voltage variable in accordance with a modulating signal; and

A second means to couple in said crystal a coherent incident beam of electromagnetic energy with flat-aligned phase planes toward a direction inclined with such an angle to cause multiple interference of said beam by said reflecting films, said crystal delivering different orders of diffracted output beams.

3,923,381

RADIANT ENERGY COLLECTION

Roland Winston, Chicago, Ill., assignor to The University of Chicago, Chicago, Ill.

Filed Dec. 28, 1973, Ser. No. 429,161

Int. Cl. G02b *5/10*

U.S. Cl. 350—293 **24 Claims**

1. A non-imaging radiant energy concentrator, said concentrator comprising:

a trough-shaped body having,

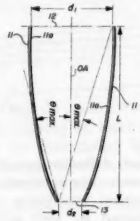
a longitudinally extending radiant energy entrance aperture with first and second opposing edges separated by a transverse distance d_1,

a longitudinally extending radiant energy exit aperture, disposed opposite said entrance aperture, with first and second opposing edges separted by a transverse distance d_2,

a pair of symmetrical substantially concave radiant energy reflecting and guiding side wall means interconnecting laterally corresponding edges of said apertures,

a field of acceptance for radiant energy,

an angular acceptance for radiant energy within said field of acceptance and determinable at said entrance aperture, and,



an optical axis determinable by reference to distances separating entrance and exit aperture opposing edges,

wherein the ratio of the distances d_2 to $d1$ is no less than the sine of said angular acceptance, the profile curve of each of said wall means is a parabola having as its parabolic focus the opposing edge of said exit aperture and as its parabolic axis a line forming an angle with said optical axis of said body numerically equal to said angular acceptance, and the field of acceptance of the body, when represented in terms of optical direction cosines, is an ellipse of semi-minor axis equal to the sine of said angular acceptance and semi-major axis substantially equal to one.

3,923,382

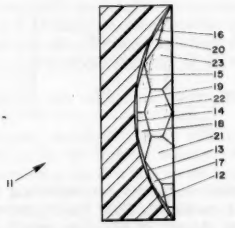
MULTIFACETED MIRROR STRUCTURE FOR INFRARED RADIATION DETECTOR

William R. Harding, State College, Pa., assignor to Leco Corporation, St. Joseph, Mich.

Filed Dec. 19, 1973, Ser. No. 426,144

Int. Cl.² G02B *5/10*

U.S. Cl. 350—296 **10 Claims**



1. A single-piece multifaceted mirror for gathering infrared radiation from a plurality of discrete, non-parallel, spaced-apart fields of view, and focusing said radiation on a single sensing element, said single-piece multifaceted mirror having a concave surface, said concave surface comprising a plurality of radiation gathering surface portions, each of said radiation gathering surface portions being concave, having an equal

focal length, and having a common focal point; the radiation gathering surface portions being so arranged that each radiation gathering surface portion gathers radiation from a separate, discrete, spaced-apart field of view.

3,923,383
FLUID-COOLED LASER MIRROR

Simon L. Engel, Mountain View, Calif., and Robert A. McFall, East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

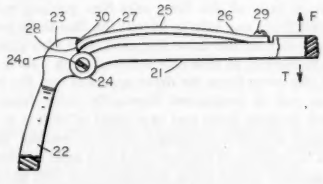
Filed June 12, 1974, Ser. No. 478,540
Int. Cl.² G02B *5/08;* **F28F** *3/14*
U.S. Cl. 350—310 **6 Claims**

1. A mirror apparatus comprising: body means defining a mirror surface; said body means defining first port means adjacent the center thereof and second port means generally outward of the first portion means and adjacent the outer peripheral edge of said body means; and means defined by the body means and associated with the first and second port means whereby a fluid can continuously flow through one of said first and second port means, generally directly to, and from, the other of said first and second port means, wherein the means defined by the body means further comprise means for providing a degree of turbulence in a fluid flowing generally directly to, and from, the other of said first and second port means, wherein the means defined by the body means comprise a chamber defined by the body means and interconnecting the first and second port means, and through which a fluid may flow, a first plurality of spaced vanes defined by the body means within said chamber and extending from adjacent said center toward the outer peripheral edge, and a second plurality of spaced vanes defined by the body means within said chamber and extending from adjacent the outer peripheral edge toward said center, each of said second vanes extending between an adjacent pair of first vanes.

3,923,384
SELF ADJUSTING SPECTACLE FRAME ASSEMBLY

Conrad L. Leblanc, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Oct. 3, 1974, Ser. No. 511,824
Int. Cl.² G02C *5/16, 5/22*
U.S. Cl. 351—113 **3 Claims**



1. A spectacle assembly comprising:

a. a front frame member for retaining a pair of lenses in a plane intersecting the line of vision of the wearer;

b. corner portions integral with said frame member at the lateral ends thereof, said corner portions including a rearwardly disposed abutment portion;

c. a pair of temple members, one pivotally mounted on each of said corner portions and extending rearwardly therefrom;

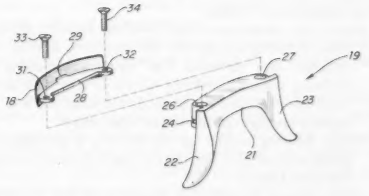
d. a pair of resilient leaf spring members, one mounted longitudinally on the foreward portion of each of said temple members, said spring members having a rearward portion, a foreward portion, and a foreward edge, the rearward portion of said spring members being rigidly fixed to the interior surfaces of said temple members and the foreward portion being unattached to said temple members, the foreward edge of said spring members positioned for abutting contact with the abutment portion of said frame corner portions;

e. hinge means for connecting said temple members to each of said corner portions and for pivotally positioning the foreward edges of said spring members into and out of contact with the abutment portion of said frame corner portions, the foreward edge of each of said spring members being disposed external and lateral to said hinge means whereby said leaf spring members are compressed along their free length by abutting pressure contact with said abutment portion when said temple members are pivoted toward the open position urging said temple members toward a closed position with respect to the spectacle front frame member.

3,923,385
NOSEPIECE AND NOSEPIECE ATTACHMENT FOR METAL FRAMES

John F. Ahern, Jr., Barrington, R.I., assignor to Itek Corporation, Lexington, Mass.

Filed Aug. 14, 1974, Ser. No. 497,783
Int. Cl.² G02C *5/02*
U.S. Cl. 351—132 **5 Claims**



1. A metal eyeglass frame comprising, in combination:

a. a pair of lens receiving portions;

b. a bridge member connecting said lens receiving portions;

c. a nosepiece, said nosepiece comprising a single piece of plastic material and including an upper arched portion adapted to engage the upper part of the nose of a wearer and a pair of side portions depending from said arched portion and adapted to engage the sides of the nose of said wearer; and

d. means for rigidly coupling said nosepiece to said bridge member, said coupling means including:

i. means for interlocking the arched portion of said nosepiece to said bridge member, said interlocking means including means for defining a lip extending substantially across the width of one of said bridge member and arched portion and means for defining a groove extending substantially across the width of the other of said bridge member and said arched portion for mating with said lip; and

ii. fastening means for rigidly fastening said nosepiece and bridge member together in said interlocked condition

e. said means for defining a lip comprises a metal bar extending substantially across the width of said bridge member and protruding therefrom; and f. said means for defining a groove extending substantially across the width of said arched portion of said nose piece for mating with said metal bar.

3,923,386

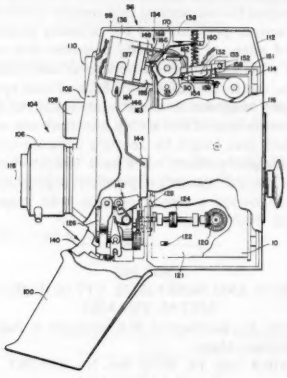
MULTIPURPOSE AUDIO-VISUAL CASSETTE SYSTEM

Donald T. Scholz, Watertown, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 374,578, June 28, 1973, Pat. No. 3,848,977. This application Aug. 5, 1974, Ser. No. 494,836

Int. Cl.² G03B *23/12*

U.S. Cl. 352—72 **4 Claims**



1. Photographic apparatus comprising:

an apparatus housing;

means for receiving a film-handling cassette having a cassette housing configured for retaining a strip of photographic film material, the cassette including opening defining means providing access to a first station configured for exposure or projection operations and a second station configured for sound operations;

image-forming means for performing a photographic program with at least a portion of the film strip located within the first station;

audio means including a sound-head for performing an audio program with a portion of the film strip located within the second station;

first selectively operative drive means for advancing the film strip through the first station when the cassette is operatively positioned in said receiving means;

second selectively operative drive means for advancing the film strip through the second station when the cassette is operatively positioned in said receiving means, said second drive means including a support member, a capstan rotatably mounted on said support member, and a motor mounted on said support member in driving engagement with said capstan, said support member being mounted in said apparatus housing for displacement between one position wherein said capstan is out of engagement with the portion of the film strip positioned within the second station and another position wherein said capstan is in pressure engagement therewith;

means for actuating both said first and said second drive means; and

means responsive to said actuating means for displacing said support member from said one position to said another position.

3,923,387

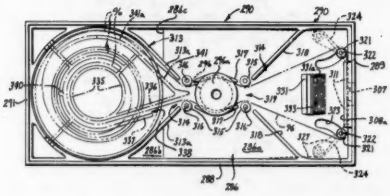
MOTION PICTURE VIEWER WITH REMOVABLE CARTRIDGE

James R. Skinner, Cupertino; Mark O. Uitz, Mountain View, and Paul W. Hait, Saratoga, all of Calif., assignors to F. J. L. Corporation, Mountain View, Calif.

Division of Ser. No. 338,893, March 7, 1973, which is a continuation of Ser. No. 78,115, Oct. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 867,289, Oct. 17, 1969. This application Feb. 22, 1974, Ser. No. 444,978

Int. Cl.² G03B *23/04, 1/16*

U.S. Cl. 352—78 R **5 Claims**

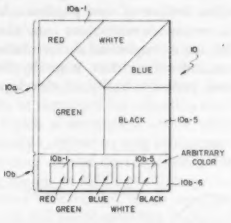


1. A cartridge for use in apparatus of the type having a housing for receiving the cartridge, reversible driving means for the cartridge and an optical assembly, said cartridge being adapted to receive a length of perforated film, said cartridge comprising means forming a framework having indexing means, said indexing means having an aperture substantially in alignment with the optical assembly when the cartridge is disposed in the housing, means for storing said length of perforated film in said cartridge, guide means in said cartridge for guiding said film along said indexing means past said aperture, said indexing means including a pair of index members spaced from each other in the direction of film travel and adapted to engage the perforations in the film, a pair of film engaging members mounted in said cartridge in a spaced relationship with respect to each other along the direction of film travel and adjacent said index members, said film engaging members urging said film against said indexing means whereby said index members engage the perforations in the film so that the film is selectively advanced on a frame by frame basis past the aperture, said film having upper and lower runs, a single drive sprocket for engaging the upper and lower runs of the film for causing movement of the film within the cartridge, said upper run overlying the lower run at the drive sprocket, means carried by the cartridge for driving the drive sprocket and adapted to be engaged by the reversible driving means in the housing, and upper and lower pairs of film guiding rollers mounted in fixed positions in said framework on opposite sides of the drive sprocket and spaced away from and out of engagement with the drive sprocket and engaging the upper and lower runs of the film, said film guiding rollers being accessible from one side to permit the film to be inserted into engagement with the drive sprocket, said film guiding rollers being positioned so that one roller of each pair is positioned rearwardly away from the drive sprocket and the other roller of each pair is positioned forwardly away from the drive sprocket to form front and rear pairs of rollers so that there is a space between imaginary lines extending through the centers of rotation of the front and rear pairs of rollers and the outer surface of the drive sprocket, said film guiding rollers also being positioned so that imaginary lines tangent to the outer surfaces of the upper and lower pairs of rollers will extend through the drive sprocket.

3,923,388
METHOD AND APPARATUS FOR THE PRODUCTION OF COLORED DESIGNS

Nathan Shenker, Brooklyn, N.Y., assignor to Tech/Ops Massachusetts, Burlington, Mass.

Filed Mar. 6, 1974, Ser. No. 448,463
Int. Cl.² G03B 21/26
U.S. Cl. 353—30 3 Claims



2. A combination comprising an optical display system for use in varying and selecting a color combination for an arbitrary pattern of interest, and a set of pattern replicas consisting of first means for representing each area of the pattern which is to be of the same uniform color, and second means for representing a plurality of separate areas which are distinct from the pattern represented by said first means; said optical display system including means cooperating with said first means for forming a first display in which individual areas correspond to respective areas represented by said first means, and cooperating with said second means for forming a second display having a plurality of separate areas each corresponding to a respective area represented by said second means; and a plurality of means each for selectively controlling the color of a respective individual area in said first display, each of said color controlling means being uniquely associated with a respective one of the separate areas formed in said second display, independent of the pattern represented by said first means, and being operative to control the color of the associated area in said second display to be the same as the color of the area in said first display controlled by said each color controlling means so that the particular color controlling means responsible for each color in said first display can be determined by inspection of the separate area in said second display whose color is the same as said each color.

3,923,389
METHOD AND APPARATUS FOR PROJECTING A SCENE

Howard G. Rogers, Weston, and Kestutis Norvaisa, West Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 763,490, Sept. 20, 1968, abandoned. This application June 8, 1971, Ser. No. 150,899
Int. Cl.² G03B 21/14
U.S. Cl. 353—38 1 Claim

1. Apparatus for projecting a scene recorded upon an image carrier as an array of regularly spaced color components arranged in a serially repetitive fashion comprising:

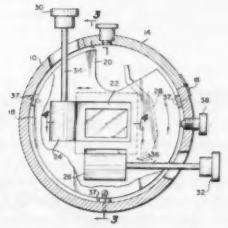
means including a projection lens system for projecting said recorded scene through an optical path and providing a magnified image thereof at an image plane; and

a diffraction grating formed upon an optical surface of said lens system for diffracting the image projected therethrough to derive at least zero and first order images from said components mutually spaced at said image plane such that any color component projected as a zero order image has superimposed upon it at least one separate color component projected as a first order image, whereby geometric patterns otherwise encountered during the projection of said array of the color components are caused to blend additively.

3,923,390
SLIDE PROJECTION APPARATUS

James Alan Susko, Findlay, Ohio, assignor to Cooper Tire & Rubber Company, Findlay, Ohio

Filed Nov. 19, 1973, Ser. No. 417,046
Int. Cl.² G03B 1/48
U.S. Cl. 353—95 4 Claims



1. In a optical slide projection apparatus, a slide holder comprising:

a pair of centrally apertured plates spaced from each other in parallel relation a distance substantially equal to the thickness of a slide to be projected and the area of the apertures corresponding substantially to the area of the slide;

a pair of cams carried by said plates and rotatably mounted on mutually perpendicular axes parallel respectively to adjacent sides of said apertures;

spring biasing means carried by said plates and operative when a slide is positioned in said holder to urge the slide into engagement with said cams; and

means extending outwardly of the apparatus permitting selective rotation of said cams to adjust the position of the slide within the holder, said cams contacting elongate portions of adjacent sides of the slide so that rotation of either cam produces straight line rectilinear sliding movement of the slide along the surface of the other cam.

3,923,391
ELECTROSTATIC PHOTOGRAPHIC COPYING APPARATUS

Takaji Washio, Toyonaka; Koichi Sasaki, and Tatsuo Aizawa, both of Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Filed Sept. 21, 1973, Ser. No. 399,516
Claims priority, application Japan, Sept. 24, 1972, 47-95460
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 8 Claims

1. An electrostatic photographic copying apparatus comprising:

a frame defining a housing with a top surface having a transparent plate on which an original to be copied is placed, a rotatable photosensitive drum for rotation in one direction as the apparatus copies having an electrostatic photographic material on the periphery thereof, an image-forming zone disposed adjacent to the periphery of said photosensitive drum for forming on said photosensi-

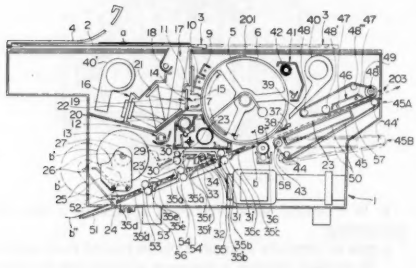
tive material an electrostatic latent image corresponding to the image of the original and a developed image corresponding to the latent image, a transfer zone for transferring said image to a transfer paper, and a transfer paper forwarding system for feeding the transfer paper on which the image has been transferred to said transfer zone and through a desired treating zone to a discharge end;

wherein said photosensitive drum is disposed within the housing with the top of the periphery thereof approaching and confronting an inner surface of the top plate of the housing adjacent a location on the inner surface;

wherein said transfer zone is positioned at an angle exceeding 180° in the direction of rotation of the photosensitive drum from the location on the inner surface of the top plate;

wherein said transfer paper forwarding system forwards a transfer paper in a substantially linear, upwardly inclined passage extending from an inlet end through the transfer zone to the discharge end;

wherein said inlet end is preceded by a nip roller adjacent thereto;



wherein said image forming zone includes at least one charging member for electrically charging said photographic material, an optical system for projecting an image of the original onto the surface of the photographic material and a developing device for developing the electrostatic latent image formed on said photographic material which are all housed within a first area defined on at least three sides of the top surface of said housing, the circumferential surface of the photosensitive drum extending from the top thereof to the transfer zone in the direction of rotation of the photosensitive drum and the transfer paper forwarding system; and

wherein a transfer paper removing member and a photosensitive drum cleaning member are housed within a second area defined on at least three sides by the top surface of the housing, the circumferential surface of the photosensitive drum which extends from the top of the photosensitive drum to the transfer zone in a direction opposite to the direction of rotation of the photosensitive drum and by the transfer paper forwarding system.

3,923,392

ELECTROPHOTOGRAPHIC COPIER

William R. Buchan, Lincoln; James E. Genthe, Chelmsford; Edward F. Mayer, Acton, all of Mass., and Robert A. Moore, Amherst, N.H., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 2, 1974, Ser. No. 429,617
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **9 Claims**

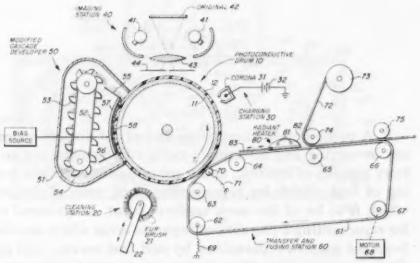
1. An electrophotographic copier comprising, in combination:

a. a rotatable drum having a photoconductive, insulating surface thereon;

b. means to apply a uniform electrostatic charge pattern to the surface of said drum;

c. means to expose said uniform electrostatic charge pattern to a light image of an original thereby forming a latent electrostatic image of the original on the surface of said drum;

d. cascade developer means for cascading electroscopic developer over said latent electrostatic image, said cascade developer means including a member closely positioned to the surface of said photoconductive drum and defining a narrow development zone therebetween, said member having a roughened surface facing the surface of said photoconductive drum, whereby the density of developer and radial velocity of developer are both increased as developer cascades through said narrow development zone;



e. an elastomeric intermediate transfer belt positioned to remove the developed toner image from the surface of said drum;

f. radiant heating means for heating the toner image on said electrostatic transfer belt; and,

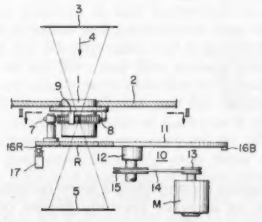
g. paper transport means for bringing paper into contact with the heated toner image on said transfer belt whereby said image is transferred and fused to said paper, said paper transport means also including means for providing for an elongated zone of contact between said transfer belt and said paper after transfer of the toner image to the paper.

3,923,393

ELECTROPHOTOGRAPHIC COLOR COPYING APPARATUS OF THE COLOR RESOLVING TYPE

Shozo Inoue, Fussa, and Hajime Katayama, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1973, Ser. No. 416,453
Claims priority, application Japan, Nov. 24, 1972, 47-117784
Int. Cl.² G03B *27/76*
U.S. Cl. 355—35 **6 Claims**



1. A color copying apparatus of the color resolving type for color-resolving a color original image into monochromatic

optical images and projecting such optical images upon an exposure station for exposure, said apparatus comprising:

projecting means for projecting therethrough the original image upon the exposure station;

color resolving means having a predetermined number of color resolving filters for color-resolving the light projected through said projection means, said filters being selectively positionable in the optical projection path of said projection means;

exposure regulating means provided in the optical projection path of said projection means and having an adjustable aperture mechanism and a member for setting the aperture-opening of said mechanism; and

means for operating said exposure regulating means having a plurality of members for adjusting said setting member, each of which is associated with a different filter and is mechanically coupled to said setting member in response to the setting of the corresponding filter of said color resolving means in said optical projection path to adjust the aperture mechanism to an aperture-opening corresponding to the predetermined exposure needed for that color.

3,923,394

EXPOSURE APPARATUS FOR USE IN PHOTOGRAPHIC COPIERS

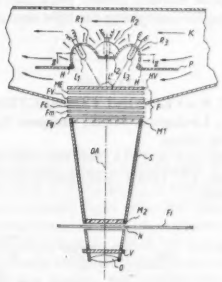
Gerhard Frankiewicz, Sauerlach, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 11, 1974, Ser. No. 522,932

Claims priority, application Germany, Nov. 13, 1973, 2356573

Int. Cl.² G03B 27/54, 27/76

U.S. Cl. 355—37 **11 Claims**



1. In a photographic copier, an exposure apparatus, comprising, in combination, a plurality of elliptical reflectors, each having a respective first focal point and a respective second focal point, with said reflectors being so arranged that said second focal points are substantially coincident and form a common focus; a plurality of light sources, each located substantially coincident with the first focal point of a respective one of said plurality of elliptical reflectors; a light duct having a mirrored inner surface and having an inlet end arranged in the vicinity of said common focus and having an outlet end; light diffusing end portions closing off said inlet end and said outlet end of said light duct; and means defining a negative plane in which a negative to be illuminated by said exposure apparatus is to be located, said negative plane lying in the vicinity of said outlet end of said light duct.

3,923,395

PROCESS FOR MEASURING THE DISTANCE OF AND THE SPEED COMPONENT OF AN OBJECT PERPENDICULAR TO A REFERENCE LINE

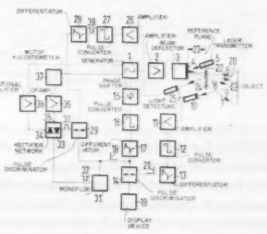
Viktor Bodlaj, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 15, 1974, Ser. No. 470,154

Claims priority, application Germany, May 17, 1973, 2325086

Int. Cl.² G01C 3/00, 3/08

U.S. Cl. 356—4 **9 Claims**



3. Apparatus for measuring the range of an object relative to a datum plane, comprising: laser beam scanning means including a beam deflector for periodically scanning a laser beam through a space in which the object is located; a laser energy detector adjacent said scanning means for detecting reflected energy from a specific direction and producing measuring pulses; generator means connected to said deflector and generating a sinusoidal signal having a linear portion and a frequency matched to the mechanical resonant frequency of said deflector; a reference circuit connected to said generator means for producing reference pulses during the linear portion of the sinusoidal voltage; and range determining means connected to said detector and to said reference circuit to measure the time between the commencement of a reference pulse and that of a measuring pulse.

3,923,396

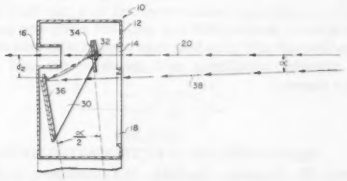
VARIABLE BASE RANGEFINDER

William P. Ewald, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 402,421, Oct. 1, 1973, abandoned. This application July 26, 1974, Ser. No. 492,115

Int. Cl.² G01C 3/24

U.S. Cl. 356—17 **8 Claims**



4. A coincidence rangefinder comprising:

a substantially planar beam splitter positioned to receive and transmit light rays from a scene along a first axis to provide a first image of the scene;

a substantially planar reflective means, positioned in a fixed non-parallel relative orientation with respect to said beam splitter, for receiving and reflecting light rays from the scene to said beam splitter along a second axis to provide a second image of the scene; and

means, mounting said beam splitter and said reflective means for movement about a fixed axis, for bringing said first and second images into coincidence by movement of

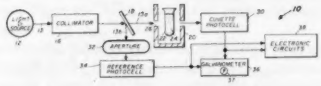
said beam splitter and said reflective means about said fixed axis.

3,923,397

HEMATOCRIT MEASURING METHOD

Reginald C. Shuck, Orlando, Fla., assignor to Stephen E. Dolive, Orlando, Fla., a part interest

Filed May 29, 1974, Ser. No. 474,170
Int. Cl.² G01N *33/16*
U.S. Cl. 356—39 **12 Claims**



1. A method for measuring a hematocrit ratio for a diluted blood sample, comprising the steps of:

passing electromagnetic energy through said blood sample;

measuring a characteristic representative of the amount of said energy absorbed by said sample;

determining a proportionality factor by dividing the hematocrit of a known blood sample by said characteristic of said known sample; and

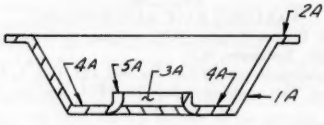
computing said hematocrit ratio by applying said proportionality factor to said measured characteristic of absorbed energy.

3,923,398

APPARATUS AND METHOD FOR FLAME ATOMIZATION

Leonard Adler, White Plains, N.Y., assignor to Trace Metals Instruments, Inc., New York, N.Y. and Itek Corporation, Lexington, Mass.

Filed Feb. 6, 1974, Ser. No. 440,253
Int. Cl.² G01J *3/02*; G01B *9/02*; G02B *5/23*
U.S. Cl. 356—85 **15 Claims**



1. A method for atomization comprising placing a micro-sample containing metal compound in a cup having an axial hole therein, heating said cup with hot gases and passing said gases through said axial hole into contact with said micro-sample, thereby volatilizing said micro-sample and atomizing metal therein.

3,923,399

MINIATURIZED SPECTROPHOTOMETER

Corwin H. Brumley, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,004
Int. Cl.² G01J *3/42*
U.S. Cl. 356—96 **11 Claims**

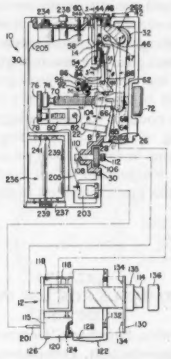
1. A miniaturized spectrophotometer used in analyzing a liquid sample, comprising:

a main assembly housing having an exteriorly accessible locking screw knob for attaching and detaching a separate liquid sample compartment housing;

a monochromator carried within said main housing including a light source and a diffraction grating for emitting monochromatic electromagnetic flux at selective wavelengths;

a separate liquid sample compartment housing detachably connected by the locking screw knob to said main housing for receiving the monochromatic flux used in analyzing a liquid sample;

a separate removable liquid sample container disposed within said sample compartment housing for carrying a liquid sample and receiving the monochromatic flux;



a photosensor and an amplifier circuit carried within said sample compartment housing for receiving attenuated flux and generating an output signal as a function of the attenuated flux;

meter means carried within said main housing and detachably electrically connected to the amplifier circuit for providing a readout as a function of the output signal; and

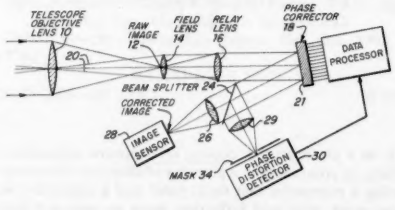
a rechargeable battery power pack carried within said main housing for energizing the light source and amplifier circuit.

3,923,400

REAL-TIME WAVEFRONT CORRECTION SYSTEM

John W. Hardy, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 3, 1974, Ser. No. 430,456
Int. Cl.² G01B *9/02*; G02B *5/23*
U.S. Cl. 356—107 **12 Claims**



1. In an optical system for imaging objects of interest through the atmosphere, apparatus for the real-time detection and correction of phase distortions in a wavefront being imaged by said optical system, said phase distortions being at least in part produced by turbulence within the atmosphere through which said object of interest is imaged, said apparatus comprising:

a. lateral shearing interferometer means, having said distorted wavefront incident thereon, for simultaneously determining in parallel and in real time relative phase differences between different areas of said distorted

wavefront, and for generating signals indicative of said phase differences, said lateral shearing interferometer means including means for permitting said interferometer means to operate with white light;

b. means responsive to said phase difference signals for simultaneously generating in parallel and in real time phase corrector signals indicative of phase corrections for different areas of said distorted wavefront to achieve a corrected wavefront; and,

c. phase corrector means having said distorted wavefront incident thereon and being responsive to said phase corrector signals for changing in real time phase differences between different areas of said distorted wavefront for changing the shape of said distorted wavefront to achieve said corrected wavefront.

3,923,401
SOLUTION CONCENTRATION RESPONSIVE APPARATUS

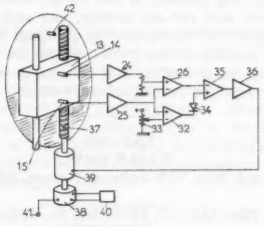
Helenio Llop, Montreuil, and Pierre Lefort, Fontenay-sous-Bois, both of France, assignors to Societe d'Optique, Precision Electronique et Mechanique — Sopelem, Paris, France

Filed Jan. 18, 1974, Ser. No. 434,698

Claims priority, application France, Feb. 28, 1973, 73.07118

Int. Cl.² G01N 21/46

U.S. Cl. 356—135 **5 Claims**



1. In solution concentration responsive apparatus including means whereby light is directed inclinedly upon a plane surface of a prism, said surface being in contact with said solution, and means whereby light reflected internally from said surface is directed towards two photoelectric cells having a separation in the direction in which the boundary formed by the limit of the totally reflected light moves as the concentration of said solution varies, the outputs of said cells being connected to means for deriving a signal related to the respective illuminations of said cells, the improvement which comprises:

multiplier means arranged to multiply the output P_1 of one said photoelectric cell by a constant of proportionality less than unity thereby to develop a modified output signal $K.P_1$;

a first differential amplifier;

means applying said modified signal to one input of said differential amplifier;

means applying the output P_2 of the other of said photoelectric cells to the other input of said differential amplifier whereby the output signal of said first differential amplifier passes through zero when $K.P_1 = P_2$, said differential amplifier output signal being applied to an input of a second differential amplifier, to the second input of which is applied the output of a third differential amplifier, said third differential amplifier receiving said other photocell signal P_2 and a reference signal and providing a negative signal when the signal P_2 is less than said reference signal.

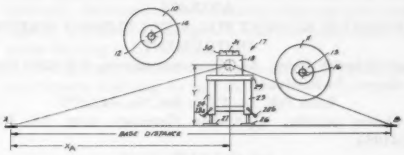
3,923,402
METHOD AND APPARATUS FOR ALIGNING PAPER MACHINERY

Paul Turcotte, Mobile, Ala., assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 10, 1973, Ser. No. 322,414

Int. Cl.² G01B 11/26

U.S. Cl. 356—152 **1 Claim**



1. The method of aligning remote axes parallel to a laser bema which has a normal position which extends perpendicular to a base line through a pair of bench marks and at a determinable height and at a determinable horizontal distance from at least one of said bench marks comprising the steps of: reflecting said laser beam at a first angle and perpendicular to its normal position such that the reflected beam points at one fo said bench marks,

reflecting said laser beam at a second angle at right angles to its normal position such that the reflected beam points at the other of said bench marks, determining the height of the normal position of the beam above said base line from said first and second angles and the known distance between said bench marks, determining the horizontal distance between one of said bench marks and the projection of the normal position of the beam on said base line from said height of the normal position of the beam and one of said first and second angles and, aligning remote axes parallel to the laser beams said normal position.

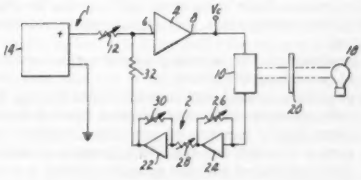
3,923,403
CIRCUIT FOR LIGHT MEASURING DEVICES AND METHOD

Lanny L. Harklau, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1974, Ser. No. 499,507

Int. Cl.² G01M 21/22; G01J 1/44

U.S. Cl. 356—201 **19 Claims**



1. A method for determining the optical density of a specimen including the steps of

1. providing a constant level light source, an operational amplifier having an output and at least one input, a first current determining means connected to said one input, a second current determining means connected between said output and said one input as a feedback circuit, said second current determining means including a photomultiplier tube positioned to receive the light from said light source;

2. adjusting at least one circuit parameter of one of said current determining means so the cathode voltage of said photomultiplier tube is the same for two conditions, a first condition wherein the specimen is in the light path be-

tween said light source and said photomultiplier tube and second condition wherein the specimen is not in said light path; and

3. using the magnitude of the adjusted circuit parameters of said one current determining means for said first and second condition in step (2) to calculate the optical density of said specimen.

3,923,404

PENDULUM SUPPORT FOR A MULTI-POINT WRITING INSTRUMENT

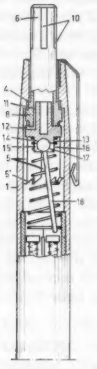
Karl Heinrich Heinz, 44, Konstanzerstrasse, CH-8280 Kreuzlingen, Switzerland

Filed Feb. 14, 1974, Ser. No. 442,577

Claims priority, application Germany, Aug. 14, 1973, 2341054

Int. Cl.² B43K *27/14*

U.S. Cl. 401—33 **1 Claim**



1. In a multi-point writing instrument having a sleeve, a plurality of point carriers projectable out of and retractable into said sleeve, a plunger-like presser, and a pendulum which effects selection and advance of the point carriers, one end of the pendulum being displacably suspended in a pendulum control and support unit which is engageable with said plunger-like presser, there being a retraction spring for urging said unit towards said presser, that improvement consisting essentially of:

a pendulum rod for selecting a point carrier and causing it to project out the sleeve;

a pendulum control and support device having mechanically separable half parts injection molded from a one-piece plastic member of generally cruciform shape in section in which one end of said pendulum rod is displacably suspended and said retraction spring is mountd for urging said support device towards said presser;

a plunger-like presser member having parts formed with grooves and radially projecting teeth segments;

means for engaging with said plunger-like presser;

an integral spring guiding collar on that side of the member presser adjacent the point carriers, said collar serving to guide the retraction spring;

a resilient, shaped cage integrally formed on said guiding-collar into which cage said one end of the pendulum rod is snap-fittable and engagable for pendulum movement;

slits being formed in spring-guiding collar and in said cage whereby the half parts of the pendulum support are elastically forced apart and separated when the said end of the pendulum rod is pressed into the cage and thus the pendulum rod is held snap-fittably in said pendulum support; and,

said resilient, shaped cage having a spherically shaped seat for locking engagement with said grooves and said radially projecting teeth segments on said presser member.

3,923,405

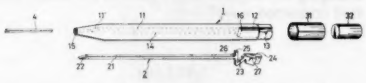
PUSH TYPE WRITING IMPLEMENT

Chang-Fu Kao, No. 148-1, Yung Lo Li, Taitong Town, Taitong, China /Taiwan

Filed Mar. 15, 1974, Ser. No. 451,540

Int. Cl.² B43K *21/10*

U.S. Cl. 401—82 **8 Claims**



1. Push type writing implement comprising a barrel to contain a core of writing medium, a channel disposed at the center of said barrel for the said core, another channel in parallel with the core channel, a push rod in said other channel, a seat at the rear of the barrel to retain the push rod, a V shaped spring integral with the push rod at its rear, said spring having an arm protruding outside the barrel wall to form a push button, a notch on said arm biased by said spring into engagement with a cut-out portion on the barrel wall to prevent the rod from slipping, said push rod being in contact with a core of writing medium in said barrel when said notch is engaged with said cut-out portion, and said button being movable against the spring force to disengage the notch from the cut-out portion and the push rod from the core, whereby the desired protrusion of the core from the barrel may also be effected by repeated pushing of said button.

3,923,406

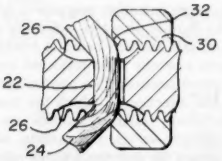
CABLE GRIP

Andrew Frank Iritz, 930 Andover Terrace, Ridgewood, N.J. 07450

Filed Mar. 17, 1975, Ser. No. 559,052

Int. Cl.² F16B *7/06*

U.S. Cl. 403—43 **12 Claims**



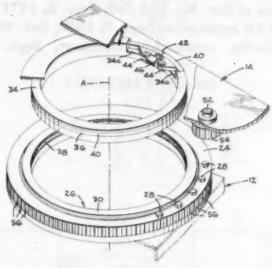
1. A cable grip for retaining selectively at least one length of an at least partially flexible member such as a cable, wire, rope and the like, said grip comprising (1) a longitudinally extensive, externally threaded shank member including a threaded midlength portion, said midlength portion being characterized by (i) a transaxial hole and (ii) a pair of substantially diametrically oppositely disposed longitudinal grooves, each groove longitudinally tapering from the outer diameter of the threads to at least the root of the threads and intersecting the transaxial hole at a depth at least equal to the root depth of the threads, and (2) deflecting means mounted on and movable along said threaded shank member, said means including a nut-like member in threaded engagement with and rotatable on said shank member so that said deflecting means may be moved toward and away from said transaxial hole and at least partially along said longitudinal grooves, whereby a cable or the like may be passed through the transaxial hole so that at least some length thereof extends beyond either end of

that hole and be secured to said shank member by rotating said nut-like member to advance said deflecting means toward and to said transaxial hole sufficiently for a surface of said means to bear upon said cable and grip it in said hole by deflecting it at either end of that hole at least partially into said longitudinal grooves.

3,923,407
MECHANISM FOR CONNECTING AND DISCONNECTING CRANE SECTIONS

Lyle B. Jensen, and Robert E. Thune, both of Cedar Rapids, Iowa, assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 6, 1974, Ser. No. 440,120
Int. Cl.² F16G *11/00*
U.S. Cl. 403—165 **8 Claims**

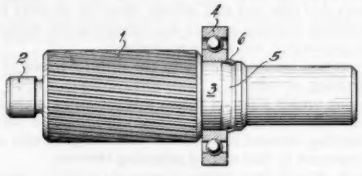


1. In a crane having a base section and having an upper section, said crane having a bearing with relatively rotatable inner and outer portions interposed between said sections, one of said bearing portions connected to one of said sections, the improvement comprising a locking member mounted in the other of said sections and shiftable relative thereto, and a power operated actuator connected to said locking member to shift said member into and out of locking engagement with the other of said bearing portions.

3,923,408
MECHANISM FOR FASTENING A RING ON A SHAFT

Manfred Belsdorf, Moorbusch, Germany, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 324,783, Jan. 18, 1973, abandoned. This application July 26, 1974, Ser. No. 492,216
Claims priority, application Germany, Feb. 2, 1972, 2204831
Int. Cl.² F16B *21/00*
U.S. Cl. 403—261 **1 Claim**

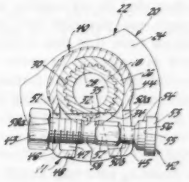


1. In combination,
a shaft;
a fixed collar on said shaft;
a ring on said shaft abutting with one face against said collar;
an annular groove recessed in said shaft adjacent said collar;
a closed locking ring having a permanent radial deformation and disposed in said annular groove in such a manner that one face of said locking ring rests against the ring to be secured while the other face of said locking ring is supported with a mechanical bias by the flank of the groove opposite the ring to be secured;
said annular groove having a substantially conical cross-section so that the greatest depth of said groove corresponds approximately to the thickness of said locking ring, said greatest depth being disposed at the side of the groove away from the ring to be secured, said locking ring being conically deformed in such a manner that one face bears against the flank of the groove and the other face supports the ring to be secured;
said locking ring is adapted to resist an axial load of said ring and secures said ring on said shaft.

3,923,409
ADJUSTABLE COUPLING CLAMP ASSEMBLY

Jacob G. Stoner, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 22, 1975, Ser. No. 543,125
Int. Cl.² F16B *2/02*
U.S. Cl. 403—290 **4 Claims**

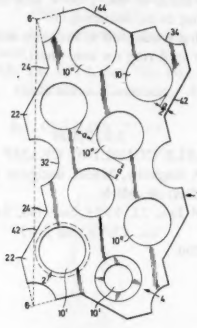


1. An adjustable coupling clamp assembly for a cylindrical shaft having a recessed flat portion on the outer periphery thereof adjacent to one end thereof, said adjustable coupling clamp assembly including a clamp and a fastening and tightening means consisting of a split ring having ears extending from the ends thereof, said ears in the free form of said clamp being in spaced apart relation to each other, said ears being apertured to receive said fastening and tightening means which includes a bolt and a nut, one of said ears having a circular aperture therethrough and the other of said ears having an elongated slot aperture therethrough, said bolt including an annular head integral with a shank extending therefrom including, in order, a reduced diameter annular shank portion next adjacent said head to define with said head an annular shoulder on said head, a further reduced diameter shank portion extending from said annular shank portion, an intermediate portion provided with a plurality of flats thereon for cooperation with said recessed flat on said shaft and, a free end portion of a diameter less than the maximum diameter of said intermediate portion and externally threaded to receive said nut which has a corresponding internal thread diameter, said interemediate portion with said flats being positioned when said head of said bolt is in abutment against said other of said ears to engage said flat recess on the shaft whereby said bolt is secured against rotation to permit said nut to be run up on said bolt to effect tightening of said split ring relative to the shaft.

3,923,410
PERFORATED INTERLOCKING SLAB

Reinhard Jordan, Baden-Baden, and Fritz Von Langsdorff, Forch, both of Germany, assignors to F. von Langsdorff Bauverfahren GmbH, Rastaat, Germany

Filed Oct. 21, 1974, Ser. No. 516,146
Claims priority, application Germany, Oct. 31, 1973, 2354600
Int. Cl.² E01C 5/00
U.S. Cl. 404—41 16 Claims

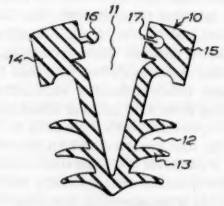


1. Perforated interlocking slab comprising in combination a face and a back bounded by an outline, said outline having portions that project and portions that are withdrawn with respect to a notional base line that forms a rectangle with opposite sides twice as long as its opposite ends are wide; said projections and withdrawn portions forming a matching pattern on said opposite ends and a matching pattern on each half length (regarded as extending from a corner) of said opposite sides of the slab whereby another like slab selectively oriented with its end abutting said half length and oriented with half the length of its side abutting said half length as may be desired interengages with said half length to prevent relative displacement longitudinally with respect to said half length; said perforations passing from said face to said back of the slab and being disposed in first rows that extend parallel to each other and in second rows that extend at right angles to said first rows and parallel to each other, said first and second rows extending obliquely with respect to said rectangular base line.

3,923,411
SEALING STRIP

Thor Johan Berghman, Tessins vag 1 A, 217 58 Malmo, Sweden

Filed Jan. 28, 1975, Ser. No. 544,775
Int. Cl.² E01C 11/10
U.S. Cl. 404—64 1 Claim

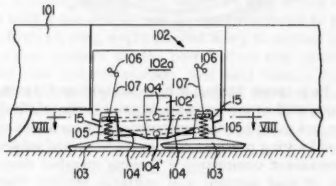


1. A sealing strip for sealing of joints between concrete slabs in pavings comprising a V-shaped body of resilient material, having formed therein a longitudinal V-shaped groove of a depth greater than half the thickness of the strip, said body having two of the outer boundary planes parallel with the side surfaces of the V-shaped groove and having flutes in its remote outer sides, a head on the free end of each of the V-limbs, the inner sides of said heads extending in alignment with the associated inner side of the V-groove, while the outer sides of said heads extend along a straight line drawn through the outer points of the portions which delimit said flutes in the outer sides of the V-limbs, said heads having on their facing inner sides snap means for securing together said heads in close proximity to each other after localization of said strip in a joint between concrete slabs.

3,923,412
DRIVE MEANS FOR VEHICLE MOUNTED VIBRATORY COMPACTOR

Albert Linz, Julweg 40, Hoffnungsthal near Cologne, Germany

Continuation of Ser. No. 178,567, Sept. 8, 1971, Pat. No. 3,834,827. This application Sept. 9, 1974, Ser. No. 504,560
Claims priority, application Germany, Sept. 23, 1970, 2046840
Int. Cl.² E01C 19/34
U.S. Cl. 404—133 15 Claims



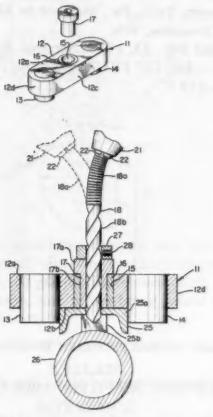
1. A compacting machine comprising in combination:
a. a vehicle with a chassis transportable to be material to be compacted;
b. a compacting unit;
c. support means for securing said compacting unit to said chassis;
d. said compacting unit including first and second vibrating elements extending parallel to one another across the chassis of said vehicle;
e. both said first and said second vibrating element having a bottom working surface for contacting the material to be compacted and an upper surface;
f. mounting means secured to the upper surface of each vibrating element;
g. spring means retained within said mounting means;
h. first vibration generator means connected to said first vibrating element and second vibration generator means connected to said second vibrating element;
i. each of said first and said second vibration generator means including a shaft, a crank secured at one of its ends to said shaft, a rod secured to the other end of said crank, said spring means being connected between said rod and said vibrating element; and
j. drive means connected to said first and to said second vibration generator means for driving said shaft to actuate said rod and said crank, thereby forcing said rod against said spring means to transmit energy from the driven shaft to said vibrating element to press same against the material to be compacted.

3,923,413

CENTERING APPARATUS

Daniel L. Giles, 455 LaFonda Ave., Santa Cruz, Calif. 95060

Continuation of Ser. No. 101,847, Dec. 28, 1970, abandoned.
This application Dec. 20, 1972, Ser. No. 316,662
Int. Cl.² B23B 49/02, 47/28
U.S. Cl. 408—72 3 Claims



1. A hand-held gun barrel rib centering device for use in installing sights on a gun barrel rib comprising:

a base body of unitary construction having a flat bottom seating face adapted to seat on top of the gun barrel rib, said base body being sized to be held with one hand in an operative centered position on the gun barrel rib without added clamping means, said base body having a vertical hole passing vertically therethrough and arranged normal to the bottom seating face to receive and provide a guide for a tool adapted to drill, tap or ream;

two rib-engaging, hole-centering legs made as an integral part of the base body, said legs being located an equal distance on opposite sides of the center of the vertical hole extending downwardly from the bottom seating face in a parallel relation with said vertical hole, said legs having a circular transverse cross section of a corresponding dimension whereby when the base body and legs are rotated about the center of the vertical hole with the bottom seating face seated on the gun barrel rib and said legs engage the sides of the gun barrel rib, the vertical hole is centered between the sides of the gun barrel rib to center the tool relative to sides of the gun barrel rib, said base body being made of a soft metal and having a center bushing of a hard metal lining the vertical hole and press-fitted therein against the inside surfaces of the base body, said legs being formed by a solid cylindrical member made of a hard metal and press-fitted into vertical apertures adjacent the ends of the base body.

3,923,414

VIBRATION DAMPING SUPPORT

David Alan Hopkins, Detroit, Mich., assignor to The Valeron Corporation, Detroit, Mich.

Filed July 16, 1973, Ser. No. 379,438
Int. Cl.² B23B 47/00
U.S. Cl. 408—143 17 Claims

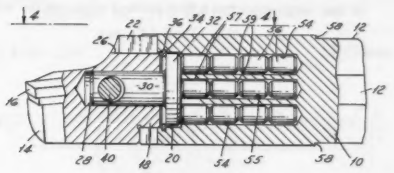
1. A machining vibration damping support, comprising;

a shank member,

a plurality of longitudinal bores in said shank member having cross sectional areas comprising a minor fraction of the cross sectional area of said shank member,

the material of said shank member surrounding said bores providing an integral structurally rigid network,

at least one mass member in each longitudinal bore having a circumference only slightly less than said bore and sized for axial as well as circumferential clearance therewithin,



said mass members being freely movable within said clearance, and

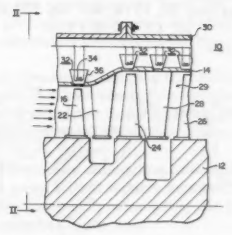
said longitudinal bores being substantially filled by said mass members with said axial clearance allowing substantially frictionless movement relative to any adjacent mass members and said shank member.

3,923,415

STEAM TURBINE EROSION REDUCTION BY ULTRASONIC ENERGY GENERATION

Robert P. Benedict, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1974, Ser. No. 479,056
Int. Cl.² F01D 5/28, 17/08
U.S. Cl. 415—1 5 Claims



1. A steam turbine having:

a rotor including at least one row of an annular array of circumferentially spaced blades;

a casing encircling said array of rotor blades, and defining a steam flow path;

at least one row of an annular array of circumferentially spaced stationary blades attached to said casing upstream of said rotor blades and extending into said steam flow path for directing steam against said rotor blades; and,

ultrasonic generator means attached to said casing exteriorly of said steam flow path for causing water droplets entrained in said steam downstream of said stationary blades to be acoustically dispersed into a fog for relatively harmless impingement upon the rotor blades.

3,923,416

TURBINE

William L. Frey, 303 Ivory Ave., Pittsburgh, Pa. 15214

Filed Apr. 4, 1974, Ser. No. 458,026
Int. Cl.² F01D 1/34
U.S. Cl. 415—76 4 Claims

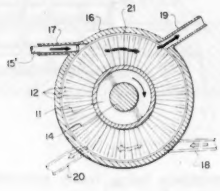
1. A turbine including:

A. a turbine wheel having a central hub and a plurality of densely spaced wire extending radially outward from the

hub substantially in a plane normal to an axis of rotation of the hub;

B. a power take-off shaft connected to the hub coaxially with the hub axis of rotation;

C. a fluid propellant means including a jet having an outlet positioned in an oblique plane to a periphery of the wheel in that said outlet has a first portion adjacent the wire and



closer to the wire than a remainder portion of the outlet, said jet directing fluid at an acute angle chordally into the wire and in the plane normal to the axis of rotation of the hub; and

D. means associated with and positioned along opposite lateral sides of the wheel to confine the chordally entering fluid within the wheel so that said fluid is discharged at points remote from said jet outlet.

3,923,417

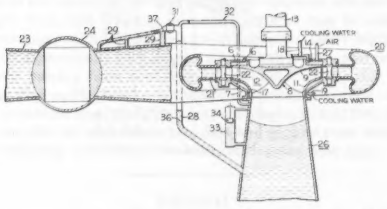
HYDRAULIC TURBINE SPIRAL CASE DRAIN

Ignacy Swiecicki, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 30, 1974, Ser. No. 537,604

Int. Cl.² F03B *13/06*

U.S. Cl. 415—110 **7 Claims**



1. A hydraulic machine comprising:

a housing;

a rotor mounted for rotation in said housing;

a spirally wound water case located about and connected to said housing in water communication with said rotor;

a tube connected to said housing in water communication with said rotor, said rotor located between said spiral case and said tube in the water path of said hydraulic machine;

a plurality of circumferentially spaced gate means connected to said spiral case selectively movable to permit and substantially interrupt the flow of water through said rotor;

valve means connected to said spiral case in spaced relation from said gate means operable to permit and interrupt the flow of water through said spiral case;

means for admitting air into said housing to depress the water from about said rotor to a level below the level of water in said spiral case when said gates and said valve are in the water interrupting positions such differential in water level resulting in a pressure head therebetween;

water overflow passage means connecting said spiral case between said valve and said gate means in water communication with said tube; and

air pressure means connected to said overflow water passage means providing air thereto at a pressure sufficient to prohibit a siphoning action from said spiral case to said tube.

3,923,418

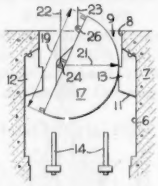
HYDRAULIC TURBINE INSTALLATION AND METHOD OF ASSEMBLING THE TURBINE HEADCOVER THEREIN

Selim A. Chacour, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 23, 1974, Ser. No. 536,031

Int. Cl.² F01D *25/24, 15/10*

U.S. Cl. 415—219 C **3 Claims**



1. A hydraulic turbine generator installation comprising in combination:

a vertically disposed turbine pit having a first inside diameter;

an annular flange about the top of said pit defining an opening having a second inside diameter less than said first diameter;

a substantially annular headcover composed of two half sections having an assembled outside diameter only slightly less than said first diameter but greater than said second diameter, each half section having an equal radius less than said second diameter;

and a plurality of arcuately spaced flanges connected to the inside of said pit spaced downwardly from said annular flange defining an inside diameter less than the assembled outside diameter of said headcover, said flanges being arranged to define therebetween diametrically opposed openings having a span therebetween greater than the diameter of said assembled headcover, the width of said openings being greater than the thickness of said half sections whereby said half sections can be supported with their diameter dimensions disposed vertically and lowered through said opening of said second diameter into alignment with said openings and then rotated through said openings so that the diameter dimension of said half sections is disposed horizontally.

3,923,419

DAMPED ELASTIC TIE DEVICE BETWEEN ROTOR BLADE AND HUB ON ROTARY-WING AIRCRAFT

René Louis Mouille, Villa "La Pinede" Le Coton Rouge, Aix-en-Provence(Bouches-du-Rhone, France

Continuation of Ser. No. 80,630, Oct. 14, 1970. This application Nov. 6, 1972, Ser. No. 304,271

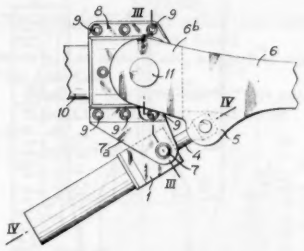
Claims priority, application France, Oct. 16, 1969, 69.35410

Int. Cl.² B64C *27/42*

U.S. Cl. 416—107 **5 Claims**

1. In a damped elastic tie device located directly between a flexible blade and rigid hub on a rotor craft rotor and forming a frequency adapter with incorporated damping, attachment means at each blade root directly and hingedly connecting the latter and said hub with a limited degree of freedom only in the plane of rotation of said blade, said attachment means comprising a portion fast with the blade and a portion fast with the hub, and interconnection means between that portion which is fast with the blade and that portion which is fast with

the hub, a damping element having a high damping rate and an elastic element whose stiffness varies proportionally to the extent of movement to either side of a neutral point, said damping element and elastic elastic element being constituted by parallel plates arranged in two sets, one of which is fast with



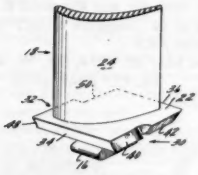
one portion of said attachment means and the other with a second portion thereof, layers of synthetic viscoelastic material of an elastomer of great stiffness and high retentivity in respect of deformation, said plates being joined by said layers interposed therebetween.

3,923,420

BLADE PLATFORM WITH FRICTION DAMPING INTERLOCK

Paul Chifos, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 30, 1973, Ser. No. 355,772
Int. Cl.² F01D 5/10
U.S. Cl. 416—190 **6 Claims**



1. A turbomachinery rotor blade for disposition within a fluid flow path in cooperation with a rotatable disc, the blade comprising:

an airfoil;

mounting means extending radially from the airfoil for attaching the blade to the disc; and

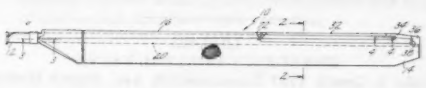
a platform disposed between the airfoil and the mounting means, the platform comprising first and second circumferential extremities and first means for abutting and interlocking said platform radially, axially and circumferentially with a similar adjacent platform to partially define the flow path and for frictionally damping radial and circumferential relative movement between said platform and said adjacent platform, said first means including first and second diagonal edges on said first extremity of said platform, said first diagonal edge being canted from the radial direction by a predetermined first angle, said second diagonal edge being canted from the radial direction by a predetermined second angle of opposite sense from said first angle, said first and second diagonal edges positioned to abut and interlock with an edge of the adjacent platform in sliding frictional engagement therewith and further positioned to effect damping of radial and circumferential relative movement between said diagonal edges and said adjacent edge during said frictional engagement.

3,923,421

LIGHTNING PROTECTED COMPOSITE HELICOPTER BLADE

Donald Richard Carter, Derby; Gerald Walter Parkinson, West Haven, and Jack Robert Cutting, Trumbull, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,407
Int. Cl.² B63H 1/26
U.S. Cl. 416—224 **13 Claims**



1. A composite helicopter blade having a tip, a leading edge, a trailing edge, and a top surface, a bottom surface, and

A. a blade root adapted to be electrically grounded to the helicopter,

B. an electrically conductive support spar electrically connected to or forming the blade root and extending to the blade tip,

C. a non-conductive blade skin member enveloping the spar and shaped to define the blade airfoil between the leading and trailing edge and extending for substantially the full blade span,

D. an electrically conductive outer leading edge anti-abrasion strip connected to the skin member at the blade leading edge at an outboard span station,

E. an electrically conductive inner leading edge abrasion strip connected to the skin member at the blade leading edge at a span station inboard of the outer anti-abrasion strip,

F. a blade tip cap enveloping the blade tip,

G. lightning grounding mechanism including;

1. means electrically connecting the blade tip cap to the spar,

2. means electrically connecting said anti-abrasion strips,

3. a light, flexible, electrically conductive member attached to the top or bottom surface of the blade and extending substantially from the blade root to the blade tip,

4. means electrically connecting said leading edge anti-abrasion strips to said flexible member, and

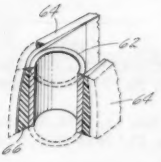
5. means for electrically connecting the root end of the flexible member to the spar.

3,923,422

TAPER LINING FOR COMPOSITE BLADE ROOT ATTACHMENT

Daniel John Ianniello, Shelton; Robert Lee Faiz, Bridgeport, and John Barry Sainsbury-Carter, Newtown, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 17, 1974, Ser. No. 515,749
Int. Cl.² B63H 1/26
U.S. Cl. 416—226 **10 Claims**



1. In a composite rotor blade for a helicopter, at least one fiber strap constituting a spar-type member extending from

the root area of said blade a finite distance along the span of said blade,

said strap having a relatively large width to thickness ratio and generally being placed flat in the blade structure,

connecting means securing said rotor blade to a rotor hub connecting member,

said strap being twisted 90° and looped 180° about said connecting means,

and means between said connecting means and said strap loop defining an inclined plane to provide for equal tension loading in the fibers of said strap.

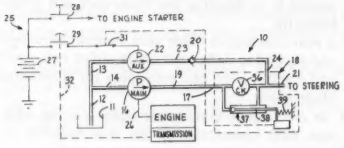
3,923,423
EMERGENCY CONTROL VALVE

John A. Lauck, 1767 Commonwealth Ave., Benton Harbor, Mich. 49022

Continuation-in-part of Ser. No. 424,181, Dec. 12, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,248

Int. Cl.² F04B *41/06*

U.S. Cl. 417—3 **10 Claims**



1. A valve for use in a system having a source of fluid, a first fluid pumping means operative by a driving mechanism and a second auxiliary fluid pumping means and switching means responsive to a change in the flow condition of said fluid caused by a lack of proper performance of said first fluid pumping means to effect an activation of said second fluid pumping means, said valve comprising:

means defining a body having an inlet port and an outlet port spaced from said inlet port;

chamber means located in said body and between and in fluid communication with said inlet port and said outlet port, said chamber means including means defining a first valve seat adjacent said inlet port;

a first elongated hollow valve member slidably disposed in said chamber means and being adapted to permit a passage of fluid therepast upon a movement of said first valve member away from the inlet of said chamber means, said first valve member including means defining a first valve face adapted to engage said first valve seat to prevent a flow of fluid therepast;

means for biasing said first valve member to the inlet end of said chamber means to effect a restriction of the flow of said fluid past said valve, said biasing means including a first spring member for urging said first valve face means into engagement with said first valve seat; and

fluid flow rate sensing means mounted internally of said first valve member for sensing the flow rate of said fluid and producing a signal in response to a predetermined flow rate, said switching means being responsive to said signal for controlling the activation of said second pumping means.

3,923,424
SELF-CLEANSING DIFFUSION PUMP

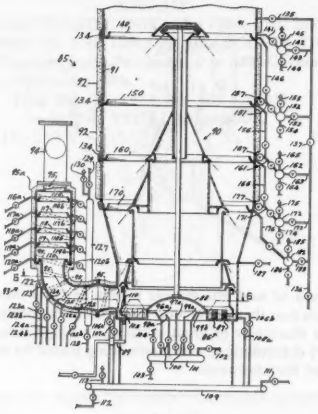
Alvin E. Buggele, No. 7 Milan Manor Drive, Milan, Ohio 44846

Filed Nov. 11, 1974, Ser. No. 522,708

Int. Cl.² F04F *9/02, 9/06, 9/08*

U.S. Cl. 417—55 **8 Claims**

1. In a diffusion pump for producing high vacuum, including a boiler, a pump barrel, at least one nozzle downstream of and operatively associated with the boiler and cooperating with the barrel, a foreline operably connected to the barrel downstream of the nozzle and a roughing vacuum pump operably connected to the downstream end of the foreline, the improvement of a conduit providing communication between the interior of the pump at the level of the surface of fluid in the boiler and a low pressure source exterior of the pump, a



valve in said conduit, means within the foreline for collecting liquid flowing down the walls thereof, a conduit providing communication between liquid in said collecting means and a low pressure source exterior of the pump, and a valve in said last-named conduit.

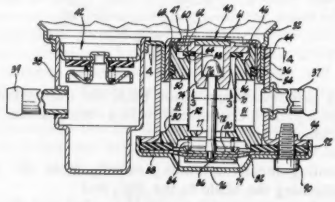
3,923,425
FUEL PUMP SHUT-OFF VALVE

David L. Porter, Bethalto, and Raymond E. Williamson, Granite City, both of Ill., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,501

Int. Cl.² F04B *49/10*

U.S. Cl. 417—298 **10 Claims**



1. In a mechanical fuel pump of the diaphragm type for use on an automotive vehicle for drawing fuel from a fuel source and delivering fuel to a point of use, said pump having a fuel inlet and a fuel outlet, said fuel outlet having an outlet check valve, the improvement comprising:

an inlet structure secured to the pumping chamber of said fuel pump and in fluid communication therewith, a cover for said structure remote from said pumping chamber,

a flexible diaphragm secured between said structure and said cover,

an inlet valve seat in said structure adjacent said pumping chamber,

a fuel inlet fitting in a wall of said structure, said fitting being positioned between said diaphragm and said valve seat,

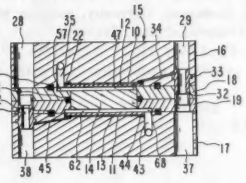
an inlet valve head including a sealing means between said valve seat and said pumping chamber, and valve stem means secured to said diaphragm at one end thereof and

attached to said valve head at its other end said flexible diaphragm and said stem means being located upstream of said inlet valve head and in fluid communication with said fuel inlet fitting.

3,923,426
ELECTROOSMOTIC PUMP AND FLUID DISPENSER INCLUDING SAME

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Aug. 15, 1974, Ser. No. 497,685
Int. Cl.² F04B *37/02*; F04F *11/00*
U.S. Cl. 417—48 **21 Claims**



13. A dispenser for dispensing a fluid comprising:

A. an electroosmotic pump for pumping a fluid susceptible to electroosmotic transport comprising:

a. a housing having an inlet for the fluid and an outlet for the fluid;

b. a pair of spaced electrodes disposed within the housing;

c. a d.c. electrical power source connected to the electrodes;

d. a porous body interposed between the electrodes in spaced relationship thereto, the porous body having a fluid entrance surface and a fluid exit surface and being capable of carrying a surface charge of opposite polarity relative to the surface charge of the fluid;

e. a cation exchange membrane interposed between the porous body and the electrode on the fluid exit surface side of said porous body; and

f. a fluid passageway in the housing extending from the inlet of said fluid entrance surface and from said fluid exit surface to the outlet;

B. a source of the fluid to be pumped by the electroosmotic pump connected to said inlet; and

C. a vessel having

a. a first chamber for containing the fluid to be dispensed having an outlet port therefor;

b. a second chamber for receiving the fluid to be pumped by the electroosmotic pump connected to the outlet of the pump housing, and

c. a movable barrier sealingly separating the first chamber from the second chamber and adapted to move in response to an increase in the volume of fluid received in the first chamber so as to dispense a correspoding volume of fluid contained in the second chamber therefrom via the outlet port.

3,923,427
DIFFERENTIAL VOLUME PUMP

Tim M. Uyeda, South San Gabriel, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,030
Int. Cl.² F04B *39/10*
U.S. Cl. 417—534 **2 Claims**

1. A differential volume pump comprising:

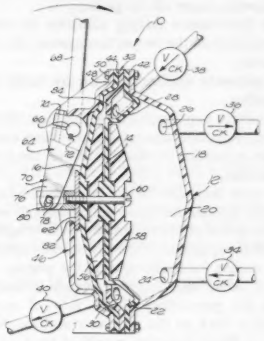
a cup-shaped front plate having a front wall and an annular outer flange behind said front wall;

a ring member behind said front plate having an outer annular flange with a peripheral configuration complementary to that of said front plate outer flange;

a front flexible diaphragm having an outer periphery disposed between said flanges;

a rear flexible diaphragm having an outer periphery engaging the rear surface of said ring member flange;

the space between said front wall and said front diaphragm providing a first chamber and the space between said diaphragms providing a second chamber, the volume of said first chamber when expanded being greater than that of said second chambere when expanded;



inlet and outlet ports opening into said first chamber;

second inlet and outlet ports opening into said second chamber;

means fastening said outer peripheries of said diaphragms and said flanges together in sealing relationship;

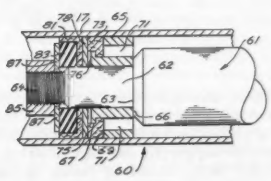
the inner periphery of said ring member extending rearwardly at an angle providing a stop for said rear diaphragm limiting forward movement thereof toward said front wall whereby during movement of the diaphragm toward said front wall the volume of said second chamber is increased; and

means coupled to said diaphragms for moving said diaphragms in unison toward and away from said front wall.

3,923,428
PUMPS

Ronald John Clark, Port Moody, and John Douglas Drummond, Burnaby, both of Canada, assignors to Western Plaster Equipment Co. Ltd., Burnaby, Canada

Continuation-in-part of Ser. No. 370,984, June 18, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,066
Int. Cl.² F16J *1/06*; F01B *31/00*; F04B *21/02*
U.S. Cl. 417—535 **2 Claims**



1. A pump including:

a. a reservoir for receiving materials to be pumped,

b. a cylinder disposed below the reservoir,

c. intake conduits connecting each end of the cylinder and the reservoir for permitting flow of material from the reservoir to the cylinder,

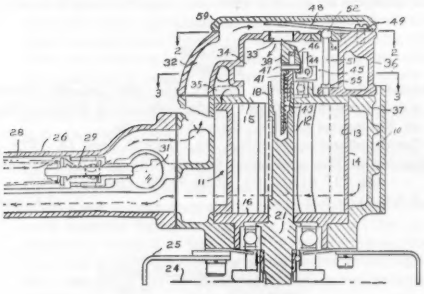
d. discharge manifold having a discharge opening disposed adjacent the cylinder,
e. discharge conduits connecting each end of the cylinder with the manifold for enabling flow of material from the cylinder to the manifold,
f. a double-headed piston assembly mounted in the cylinder for reciprocal movement, said piston assembly including:
i. a piston disposed axially of the cylinder and being of smaller diameter than the cylinder and having axially disposed cylindrical projections at each end thereof,
ii. a cylindrical guide mounted on the cylindrical projection slideably engaging the cylinder walls,
iii. oil passages extending through an opening out of opposite faces of the guide,
iv. a felt washer having slideable fit with the cylinder mounted on the projection against the outer face of the guide,
v. a pressure washer against the outer face of the felt washer,
vi. a piston cup formed of a flexible material mounted on the projection against the pressure washer,
vii. an expansion washer fitted over the projection against the cup,
viii. a nut threaded on the projection adapted to be tightened against the expansion washer so as to obtain radial expansion of the expansion washer against the cup and radial expansion of the felt washer against the cylinder,
g. means for reciprocating the piston,
h. check valve assemblies in the intake and discharge conduits for preventing return flow of material from the cylinder back to the reservoir and for preventing return flow of fluid from the manifold back to the cylinder so that material is drawn from the reservoir and pumped into the manifold at each stroke of the piston assembly.

3,923,429

OVERSPEED SAFETY DEVICE FOR ROTARY TOOLS

Raymond J. Schaedler, New Hartford, and Robert D. Roth, Utica, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed June 3, 1974, Ser. No. 475,814
Int. Cl.[2] F01C *21/12*; G05D *13/10*
U.S. Cl. 418—43 **6 Claims**



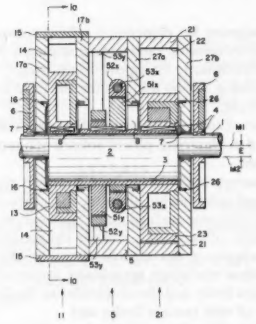
1. In a rotary tool including a housing, a rotary air motor, an inlet port for admitting operating air to the motor, and a safety valve controlling air flow through the port to the motor, a trip releasably supporting the valve in an open normal position, the valve being constantly biased against the trip in a closing direction, the trip being located at a predetermined radial distance from the axis of the motor, trip actuating means carried by the motor having response to a predetermined centrifugal force developed by the motor to move outwardly in a path of rotation in which the trip is located so as to cause the latter to be upset and as a consequence release its support from the valve, and the housing having first and second internal shoulders; wherein the safety valve is a leaf spring anchored at one end upon the first shoulder and having an opposite end resiliently movable from a position lying closed over the port to the open normal position; and wherein the trip is a pin having a bottom end releasably seated upon the second shoulder and having an upper end normally abutting an undersurface of the leaf spring between the ends of the latter and supporting the leaf spring in its open position.

3,923,430

PARALLEL -AXLE AND INNER-AXLE ROTARY PISTON ENGINE OF TROCHOIDAL CONSTRUCTION WITH A FOLLOW-UP DRIVE TRAVELING IN SLIDING BARS AND FORCING THE PISTON MOVEMENTS

Franz Huf, Konstanz, Germany, assignor to Dornier System GmbH, Friedrichshafen, Germany

Filed May 31, 1974, Ser. No. 475,025
Claims priority, application Germany, Aug. 7, 1973, 2339911
Int. Cl.[2] F01C *1/02*; F04C *17/02*
U.S. Cl. 418—60 **7 Claims**



1. In a rotary piston engine of trochoidal construction having an inlet, an outlet, a drive shaft, and a piston designed as an epitrochoid 1:1, an inner housing wall conforming to the outer envelope curve of the epitrochoid, with radial seals and enclosing working chambers, and a follow-up drive effecting the planetary piston movement,
the improvement which comprises a single cylindrical body means nonrotatably mounted on the engine drive shaft and eccentrically offset with respect thereto by the extent of the trochoid eccentricity, said cylindrical body having a radius at least equal to the trochoid eccentricity plus the radius of the engine drive shaft,
sleeve means rotatably mounted on said cylindrical body means and serving as a carrier for elements of the follow-up drive non-rotatably connected thereto, and for the piston,
a plurality of pistons and coordinated working chambers mounted in tandem in the axial direction of the engine,
the axes of said working chambers being positioned in housings pivoted around the engine axis by an angular amount with respect to each other,
said pistons non-rotatably mounted on said sleeve being displaced, as compared to the central axis thereof, with respect to each other in each case by double the corresponding angular amounts,
and said follow-up drive being common to all said pistons.

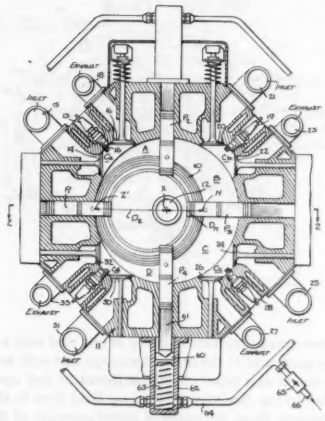
3,923,431
SEALED SLIDE PLATES FOR ROTARY INTERNAL COMBUSTION ENGINE

Harold G. Abbey, 75 Prospect St., East Orange, N.J. 07017

Continuation-in-part of Ser. No. 318,664, Dec. 26, 1972, Pat. No. 3,809,024. This application Mar. 20, 1974, Ser. No. 452,966

Int. Cl.² F02B *53/00*

U.S. Cl. 418—61 R 9 Claims



1. In an internal combustion engine, the combination comprising a circular rotor eccentrically supported on a shaft, a stator having a circular chamber, said shaft being coaxially mounted within the circular chamber of said stator, slide plates extending into said chamber and in continuous contact with the rotor surface to divide the chamber into operating zones of varying volume, the slide plates being tracked in guide slots formed in the internal side walls of the stator, each slide plate being constituted by the main body from which extends a pair of legs straddling the peripheral edges of the rotor, and a cross piece extending between the legs and formed of a bearing material engaging the surface of the rotor, the legs terminating in feet encircled with ring seals which are pressed against the related edges of the rotor and the sides of the guide slots, whereby leakage through the clearances at the rotor edges and at the guide slots is prevented.

3,923,432
ROTOR HOUSING OF A ROTARY ENGINE

Takeshi Nakakobara, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

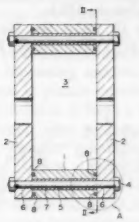
Filed Mar. 22, 1974, Ser. No. 453,936

Claims priority, application Japan, Oct. 29, 1973, 48-121437

Int. Cl.² F01C *1/02*

U.S. Cl. 418—61 A 4 Claims

1. A rotor housing of a rotary engine, said rotor housing being formed with bolt receiving bores extending along its wall surface in the direction of the rotor axis and adapted to be closed at its opposite ends by a side housing and/or intermediate housing clamped thereto by means of bolts passing through said bores, thereby defining a rotor chamber therein wherein a sleeve is disposed in the bore to reinforce the peripheral region of said bore against compression applied in the axially direction of said bore, said sleeve being flush with the end faces of the rotor housing and being made of a material



having a higher elasticity and creep limit than that of said rotor housing.

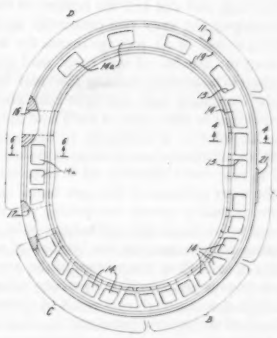
3,923,433
DIE-CAST ROTOR HOUSING FOR ROTARY COMBUSTION ENGINES

Walter Ludwig Hermes, Cedar Grove; Murray Berkowitz, Woodcliff Lake, and Charles Lombaerde, Ridgewood, all of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed July 18, 1974, Ser. No. 489,595

Int. Cl.² F01C *21/06*

U.S. Cl. 418—83 4 Claims

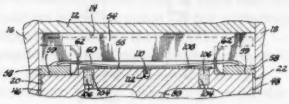


1. A generally annular die-cast rotor housing shell for rotary internal combustion engines of the trochoidal type having a longitudinal axis and parallel side faces normal to the axis, the shell having an inner wall with a trochoidal inner surface and an outer wall spaced apart radially from the inner wall and having a plurality of generally axially oriented coolant passages therethrough between the inner and outer walls open at each side face and spaced circumferentially around the shell for flow of liquid coolant therethrough across the width of the shell in the generally axial direction, wherein the improvement comprises: at least some of the coolant passges having rectilinear individual axes slanted from each side wall angularly to the inner trochoidal surface and meeting at an angle at a position radially closer to the shell axis at the mid-plane between the shell faces so that the the inner wall of the shell is thinner at the midportion than at the side faces, the coolant passages having slanted axes comprising a plurality of groups of associated passages, each group of associated passages being circumferentially disposed along an arcutate portion of the generally annular shell, the associated passages of each group having their individual axes parallel to each other and nonparallel to the individual axes of the passages of other groups.

3,923,434
ROTARY COMBUSTION ENGINE APEX SEAL LUBRICATION

Leslie K. Walters, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 10, 1974, Ser. No. 487,172
Int. Cl.² F01C *19/02*, *21/04*; F04C *27/00*
U.S. Cl. 418—91 2 Claims



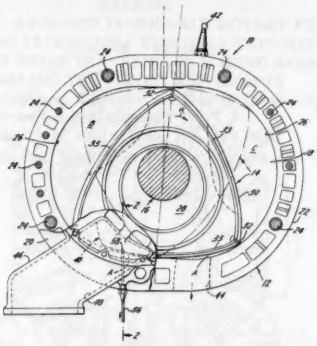
1. A rotary combustion engine comprising an engine housing having an internal peripheral wall and oppositely facing end walls cooperatively defining a cavity, a shaft extending through said cavity and end walls and rotatably supported by said housing, a hollow rotor located in said cavity and rotatably mounted on said shaft and having apexes that remain close to said internal peripheral wall as said shaft and rotor rotate, said rotor having a circumferentially extending wall cooperating with said peripheral wall of said housing an oppositely facing radially extending side walls cooperating with said end walls of said housing to provide a plurality of chambers between said apexes that are spaced about and move with said rotor while varying in volume as said rotor and said shaft rotate, apex seals mounted in slots in said rotor at said apexes for engaging said peripheral wall, a spring arranged between the bottom of each said slot and the bottom of the associated apex seal for urging the apex seal outwardly against said peripheral wall, a source of oil, passage means for delivering the oil to and from the interior of said rotor, said rotor having a central rib therein extending radially inwardly from said circumferentially extending wall, and apex seal lubricant metering means mounted in said rotor at each said apex for metering oil from the interior of said rotor to the associated apex seal slot without permitting combustion pressure to backpressure the oil in said rotor whereby oil is effectively delivered directly to the wear surfaces of the apex seals, each said apex seal lubricant metering means comprising a pair of porous plugs mounted in lubricant delivery holes in said circumferentially extending wall connecting the interior of said rotor on opposite sides of said rib to the bottom of the associated apex seal slot, said porous plugs having a porosity effective to permit oil to diffuse therethrough as a result of centrifugal forces on the body of oil within said rotor and at a rate sufficient to adequately lubricate said apex seals at minimum rotor speed and load and as a result of continuing centrifugal action on the oil in the interior of said rotor providing increasing oil delivery to increase the lubrication of said apex seals with increasing rotor speed, a flat spring valve arranged between each said apex seal spring and the bottom of the associated apex seal slot and extending at opposite ends along flexible portions over the associated porous plugs for opening the porous plugs only when the oil pressure acting on the porous plug side of the flexible portions exceeds the gas pressure from said chambers acting on the opposite side by a predetermined amount.

3,923,435
LUBRICANT METERING SYSTEM FOR THE WORKING CHAMBERS OF A ROTARY MECHANISM

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 21, 1974, Ser. No. 453,436
Int. Cl.² F04C *29/02*; F01M *11/02*
U.S. Cl. 418—100 6 Claims

1. In a rotary mechanism having a rotor supported for planetation in a housing cavity and defining with the housing a plurality of working chambers which successively expand and contract in volumetric size as the rotor rotates and also having an inlet port means in the housing so that the rotor covers and uncovers the inlet port means with each of said working chambers and uncovers said port means only after each working chamber starts to expand in volume so that the initial opening of the inlet port means occurs when the pressure in said working chamber is substantially less than the pressure in the inlet port means, whereby the initial portion of the gaseous fluid entering a working chamber does so at relatively high velocity, a lubricant metering system for supplying lubricant to the rotor of the mechanism comprising:

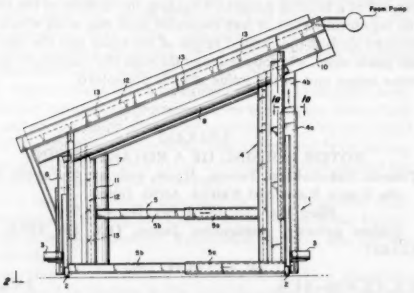


passageway means communicating at one end with a source of lubricant and at the other discharge end with said inlet port means at a point closely adjacent to and upstream, relative to the direction of gaseous fluid flow to the inlet port means, from the point of initial opening of the inlet port means to provide lubricant at said other end for entrainment by fluid passing through said inlet port means into said plurality of working chambers during initial opening of the inlet port means.

3,923,436
APPARATUS FOR FORMING INTEGRAL HOMOGENEOUS BUILDINGS

David W. Lewis, The Shadows, Rte. 2, Box 198, Charlottesville, Va. 22901

Filed Mar. 7, 1974, Ser. No. 449,010
Int. Cl.² B29D *27/04*
U.S. Cl. 425—64 8 Claims



1. A machine for continuously producing homogeneous building structures from formable materials including frame member means to continuously move said frame member over the area to be occupied by said building while formable material is being fed thereto, support elements on said frame member, vertical form members attached to said supports, horizontal form members attached to said supports, supply means

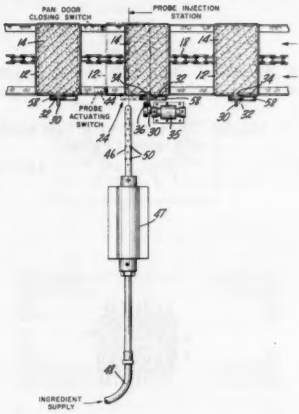
positioned adjacent to said form members for supplying formable material thereto, positioning means movably mounted on the foremost portions of said frame member, with arms extending therefrom into the area defined by said form members, means on said arms to hold, in their proper position, elements desired to be incorporated into said building.

3,923,437

APPARATUS FOR INSERTING FILLING IN BREAD

Frederick G. Gahagan, 255 Bayville Road, Locust Valley, N.Y. 11959

Filed Nov. 7, 1973, Ser. No. 413,527
Int. Cl.² A21D 2/00
U.S. Cl. 425—130 6 Claims



1. Apparatus for inserting filler material in bread comprising:

a. an elongated pan having a bottom and side walls, two of said side walls being shorter than the other two of said side walls, said pan being adapted to be filled with dough;

b. a port extending through a substantially central area of a short side wall of said pan;

c. means for selectively covering and uncovering said port; and

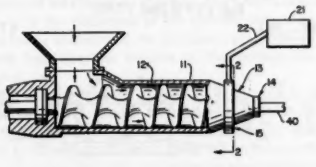
d. a filler probe positioned so as to be inserted through said port when said port is in an uncovered position.

3,923,438

APPARATUS FOR MAKING VARIEGATED SOAP BASE

Giulio Perla, Rome, Italy, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,477
Claims priority, application Italy, Sept. 5, 1973, 50733/73
Int. Cl.² B29F 3/12
U.S. Cl. 425—131.1 8 Claims



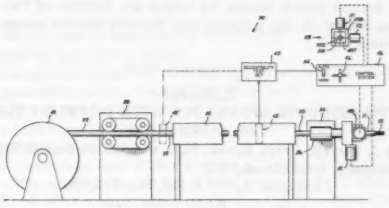
1. Apparatus for the continuous production of striped soap comprising a terminal cone of a soap plodder having an internal conical passageway and a series of circumferentially spaced apertures in its surface, an extrusion nozzle mounted at the smaller end of said passageway, means for feeding a solid column of a first soap in plastic condition under pressure through said passageway in a direction toward said extrusion nozzle, depositing means in the path of said solid column providing a plurality of circumferentially spaced downstream facing openings for depositing and imbedding streams of a different soap or soaps in plastic condition within and along the periphery of said column to form a slidably moving composite soap mass within said passageway, said depositing means including an annular manifold disposed externally around said cone and having a series of substantially radial projections extending inwardly at said cone apertures, said downstream facing openings being on the inner ends of said projections, said soap mass being substantially uniformly radially compressed during movement along said passageway.

3,923,439

SYSTEM FOR CONTROLLING THE ECCENTRICITY OF AN EXTRUDED ARTICLE

Arthur Merle Isley; Robert Wayne Rake, both of Phoenix, and Albert Sanford Tingley, Glendale, all of Ariz., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 296,505, Oct. 10, 1972. This application July 30, 1974, Ser. No. 493,200
Int. Cl.² B29D 23/04
U.S. Cl. 425—150 8 Claims



1. A system for controlling the eccentricity and uniformity of a plastic jacket being extruded onto a longitudinally moving elongated core passing through a hollow core tube positioned within a passageway formed in a die to define an annular extrusion orifice therebetween, which comprises:

means for measuring the eccentricity of the jacket along a diametric cross-sectional axis therethrough;

means for generating a polarized analog signal representative of the direction and magnitude of the eccentricity of the jacket along said axis;

level detecting means responsive to the magnitude and direction of said analog signal for generating a binary signal indicative of the direction of said eccentricity along said axis;

a motor having an output, a first input for driving said output in a first direction and a second input for driving said output in a second direction;

a motor driving oscillator;

gating means responsive to said binary signal for applying signals from said oscillator selectively to drive one of said inputs of said motor to cause said output to be driven in accordance with said binary signal;

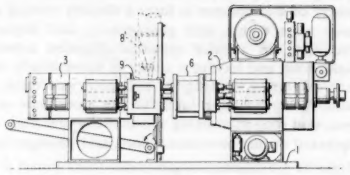
universal means pivotally mounting said core tube for angular movement in the die passageway; and

means coupling said output of said motor to said core tube for imparting angular movement to said tube in first or second directions in a plane coincident with said measuring axis when said output is driven in said first or second direction, respectively to alter the extrusion orifice to compensate for the measured eccentricity.

3,923,440
HYDRAULIC PRESS FOR THE MOLDING OF TILES AND PLATES OF CERAMIC OR LIKE MATERIALS

Luigi Bettonica, Via Clusone, 3, Milan, Italy

Filed July 23, 1974, Ser. No. 491,150
Claims priority, application Italy, Aug. 17, 1973, 27946/73
Int. Cl.² B29F 1/00, 1/06
U.S. Cl. 425—167 4 Claims

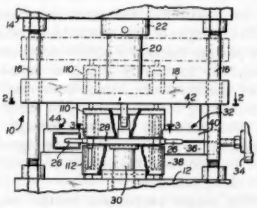


1. A press for the making of tiles and like material, comprising: a horizontal base to which a fore stationary bed, and a rear stationary bed are firmly secured; first operating punch means, die means and two horizontally extending, cylindrical guide columns parallel with the horizontal base having their both ends fastened to said stationary bed, a first cross-member with which the operating punch means is connected, a second cross-member bearing the die means, vertical duct means through which the material to be pressed is allowed to flow into the die means, a body firmly secured to the stationary rear bed, second punch means by which the bottom of the die means is formed; and programmed memory control means for the press.

3,923,441
BLOW MOLDING APPARATUS WITH DOUBLE CYCLE FOR CORE RODS

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Filed June 3, 1974, Ser. No. 476,092
Int. Cl.² B29C 1/00, 5/10
U.S. Cl. 425—242 B 20 Claims

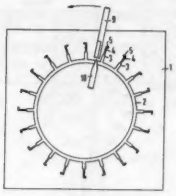


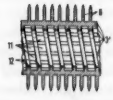
1. Blow molding apparatus including in combination two groups of core rods, an indexable support by which the core rods are carried, connections between the core rods and support, transmition means for shifting the core rods of each group between active and inactive positions, a temperature controlling chamber through which core rods that are in inactive positions pass during a cycle in which they are in their inactive positions, a coating station including means for applying a parison to successive core rods that are in active positions on the support, a blowing station for receiving successive core rods that are in active position on the table, a stripper station along the path of the active core rods, a changeover station between the coating station and the blowing station and at which a core rod can move from inactive to active position and vice versa, and wherein the support is movable to carry each core rod successively through the cycle to bring the core rods that are in active positions from one station to the next and to carry each core rod that is in inactive position past the blowing, stripper and coating stations with no interaction between the inactive core rods and these stations.

3,923,442
APPARATUS FOR THE PRODUCTION OF THERMOPLASTIC ARTICLES WITH BURDOCK-LIKE HOOKS

Arno Stöhr, Bamberger Strasse 6, 8641 Neuses, Bavaria, Germany

Filed Aug. 10, 1973, Ser. No. 387,366
Claims priority, application Germany, Aug. 11, 1972, 2239559
Int. Cl.² A01N 9/20
U.S. Cl. 425—309 4 Claims



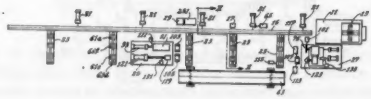


1. Apparatus for the production of thermoplastic articles with hooks, comprising means for extruding a profile form and longitudinal ribs, particularly with a rod-, tube- or ribbon-like carrier, said means including an extruder die having a circular opening for producing a tubular extruded form, a plurality of slits regularly distributed over the circumference of said circular opening, said slits tapering outwardly in cross-section and ending in thin hooked portions forming said longitudinal ribs, means for repeatedly cutting said ribs transversely to the extruding direction while still in a plastic state and means for simultaneously stretching said profile form in extruding direction so as to form separate hooks, means for cooling said extruded form, and means for cutting it into articles of desired length.

3,923,443
PIPE BELLING AND CHAMFERING MACHINE

Vernon V. Emery, Sun Valley; Charles W. Howe, Pasadena, and Joseph Marcella, Sun Valley, all of Calif., assignors to Vern Emery Company, Inc., Pacoima, Calif.

Filed Aug. 7, 1970, Ser. No. 62,100
Int. Cl.² B29C 17/00
U.S. Cl. 425—384 17 Claims



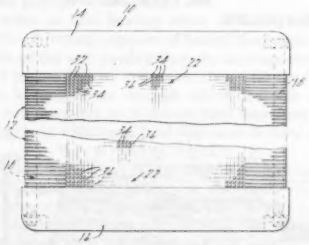
1. A machine for reforming a length of pipe comprising an indexing conveyor having

pipe carrying means thereon,
means for moving said pipe carrying means from
a first position in which a length of pipe to be reformed is received to
a second position in which the length of pipe is aligned with a reforming tool, and
a reforming tool positioned adjacent to said indexing conveyor and comprising
heater means for heating one end of a length of pipe in alignment therewith including
air heating means,
air flow means for directing air across said air heating means, and
air passage means for directing the heated air across the outer and inner surface of the one end of a length of pipe.

3,923,444
EXTRUSION DIE

Michael J. Esper, Detroit, and Louis J. Mitchell, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 3, 1974, Ser. No. 466,651
Int. Cl.[2] B29F 3/04
U.S. Cl. 425—461 **1 Claim**

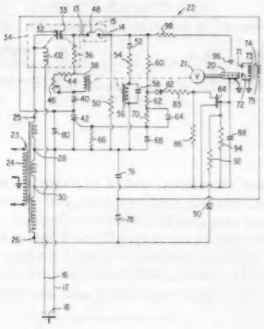


1. An extrusion die for forming an extruded article having a plurality of interconnected walls which define passageways therebetween, the extrusion die comprising:
a plurality of elongated extrusion plates stacked one upon another; and
clamping means for holding the plurality of extrusion plates in a stacked condition;
each of the extrusion plates having on both upper and lower surfaces thereof;
a. a leading edge zone and a trailing edge zone,
b. recessed areas on the trailing edge zone, which areas of juxtaposed extrusion plates define material feed channels when the extrusion plates are in a stacked condition,
c. spacing bosses located at both ends of the extrusion plate in at least the trailing edge zone, which bosses locate juxtaposed extrusion plates so that the recessed areas of the extrusion plates are spaced apart to define the feed channels,
d. finger slots on the leading edge zone the finger slots defining individual fingers therebetween, the so defined fingers of an extrusion plate having a thickness dimension less than the thickness of the spacing bosses on the upper and lower surfaces of the extrusion plate whereby a space exists between the fingers of the juxtaposed extrusion plates;
e. small spacing bosses at various locations in the trailing edge zone to divide up the recessed areas of the extrusion plate, such small spacing bosses extending generally parallel to the feed channels from the trailing edge zone of the extrusion plate to a location spaced rearwardly of the fingers; and wherein
f. the recessed areas defining the feed channels are interconnected with the finger slots and the space between juxtaposed fingers when the extrusion plates are in a stacked condition.

3,923,445
BURNER IGNITION SYSTEM HAVING SAFETY SWITCH WITH REMOTE RESET

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 10, 1974, Ser. No. 459,822
Int. Cl.[2] F23N 5/00
U.S. Cl. 431—71 **3 Claims**



1. An electric ignition system comprising
means for generating sparks,
flame sensing means for terminating operation of the spark generating means when a flame is sensed,
a safety switch having a pair of normally closed contacts and a resistance heat motor serially connected with the spark generating means,
said resistance heat motor capable of opening the closed contacts when the flame sensing means fails to sense a flame after a predetermined duration of operation of the spark generating means,
said safety switch including electromagnetic means for resetting the contacts in a closed position,
switch means disposed at a location remote from the ignition circuit for energizing the electromagnetic means,
a transformer having a secondary winding,
said spark generating means being energized by the secondary winding of the transformer, and
said electromagnetic means being in series with the switch means across the secondary winding of the transformer.

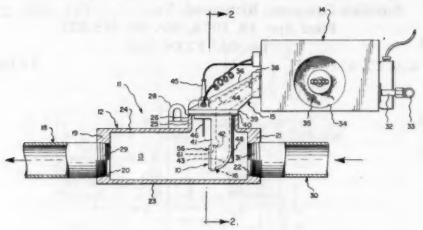
3,923,446
VIBRATION CANCELLING BURNER GRID FOR A HEATING SYSTEM

Robert G. Budden, Clarence, and Eugene W. Butlak, Buffalo, both of N.Y., assignors to Roberts-Gordon Appliance Corporation, Buffalo, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,259
Int. Cl.[2] F23D 13/00
U.S. Cl. 431—114 **5 Claims**

1. In a heating system including a housing defining a combustion chamber therewithin, a conduit adapted to supply a combustible fuel-air mixture and having at one end thereof a multi-port burner head provided with a plurality of perforations through which said mixture may pass to be ignited and burned within said combustion chamber, and an elongated flue pipe communicating with said combustion chamber to convey products of combustion therefrom, the improvement comprising:
a burner grid adapted to alter the normal vibrations generated by a dynamic flame front produced by such burning

of such supplied mixture, said burner grid being a plate-like member having one surface arranged to cover said burner head, an opposite surface arranged to face into said combustion chamber, a primary port communicating said surfaces and through which said mixture may pass to support combustion of a primary flame front generating



primary vibrations, and a plurality of secondary ports communicating said surfaces and through which said mixture may pass to support combustion of a corresponding plurality of secondary flame fronts generating secondary vibrations dissimilar to said primary vibrations and adpated to destructively interfere with said primary vibrations when superimposed in said flue pipe.

3,923,447

BURNER OF USE WITH FLUID FUELS

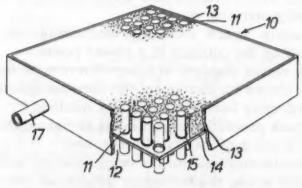
Denis Henry Desty, Walton-on-Thames, and David Montagu Whitehead, Camberley, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 8, 1968, Ser. No. 765,909

Claims priority, application United Kingdom, Oct. 10, 1967, 46172/67

Int. Cl.² F23D *3/40*

U.S. Cl. 431—326 **17 Claims**



1. A diffusion flame burner for fluid fuels, said burner comprising means forming a fuel chamber having a fluid-tight bottom portion defining an air-inlet zone, a top portion defining a combustion zone, and a fluid-tight side portion between said bottom portion and said top portion, said burner also comprising a plurality of combustion air tubes passing through said fuel chamber from said bottom portion to said top portion for conducting combustion air through said chamber from said air-inlet zone to said combustion zone in confined streams out of contact with fuel in said chamber, said fuel chamber being open to the atmosphere at its said top portion only and being divided into a sequence of fuel spaces in superposed relation to each other between said bottom portion and said top portion:

a. at least one fuel space of said sequence being an unpacked fuel space which provides a low resistance to the flow of fuel across the burner,

b. at least one other fuel space of said sequence being a packed fuel space in which the packing is of a type having capillary size channels and is adapted to control the flow of fuel towards the combustion zone, the first fuel space of said sequence being unpacked and constituting a fuel inlet space adapted to be connected to a fuel supply and the last fuel space of said sequence being packed and constituting a fuel outlet space communicating with the combustion zone, the packing being exposed to the ambient and being unobstructed across its upper surface whereby, during the use of the burner, air flows through the combustion air tubes into the combustion zone where it reacts with the fuel which flows upwardly and through said fuel outlet space into the combustion zone thereabove, said fuel and air mixing only in said combustion zone and the resulting fuel-air mixture burning as a diffusion flame in said combustion zone, and

c. the bore of each combustion air tube being 0.01–1.0 cm^2 where it opens into the combustion zone and the bores of the tubes accounting for at least 25% of the surface of said fuel outlet space adjacent to the combustion zone.

3,923,448

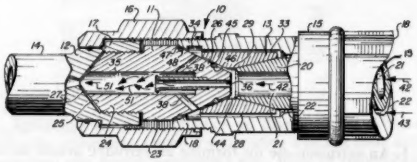
FUEL MIXING CHAMBER FOR WELDING AND CUTTING TORCHES

Carl R. Guth, 10215 N. 38th St., Phoenix, Ariz. 85028

Filed Oct. 15, 1974, Ser. No. 514,456

Int. Cl.² F23D *13/40*

U.S. Cl. 431—354 **9 Claims**



1. A mixing chamber for a fuel burner comprising:

a control fuel mixing element,

an upstream outer shell for connection to handle means,

a downstream adaptor for connection with a nozzle means, said fuel mixing element, upstream outer shell and downstream adaptor all having an opening extending therethrough for jointly defining a first gas passageway,

coupling means for axially aligning said fuel mixing element, upstream outer shell and downstream adaptor and placing their openings in axial alignment,

nozzle means having an outer diameter smaller than the opening of said mixing element and arranged therein,

said nozzle means defining a gas expansion space between it and the inside periphery of said opening of said mixing element, and having a flared end at its downstream end for discharging a first gas therethrough, and

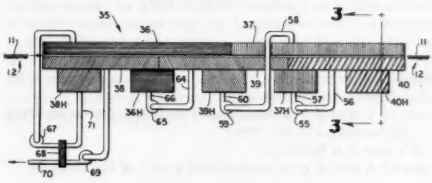
means defining a second gas passageway extending through said fuel mixing element and into its hollow opening laterally of said nozzle means for discharging a second gas transmitted thereby laterally of said flared end of said nozzle means in the downstream direction of the movement of the first gas through said nozzle means,

said flared end of said nozzle means retarding the movement of the second gas over the discharging end of said nozzle means into the stream of said first gas discharged by the nozzle means and creating eddies in the mixing first and second gases.

3,923,449
MULTISTAGE OVEN WITH PROGRESSIVE CIRCULATION

James Donald Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Mar. 22, 1974, Ser. No. 453,839
Int. Cl. F27b 9/28
U.S. Cl. 432—59 9 Claims



5. Apparatus for progressively applying heat to a web of material which is moving along a predetermined path and which may contain moisture, comprising:

closure means enclosing at least a portion of said predetermined path, said closure means defining a plurality of separate web heating zones serially disposed along the enclosed portion of said path;

at least some of said heating zones including individual means for directing a stream of heated fluid onto at least one side of the web passing through the respective zone; exhaust means directly communicating with the first one of said heating zones through which the web initially passes and operative to withdraw fluid therefrom and to discharge said withdrawn fluid from said heating apparatus;

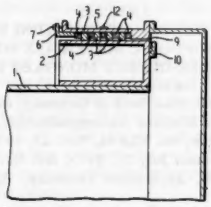
fluid flow communication means directly connecting each of said heating zones, except for the final one of the heating zones along which the web passes, with a serially subsequent heating zone and allowing said first heating zone and each such connected heating zones to receive substantial make-up fluid only from such serially subsequent heating zone; and

means associated with each at said heating zones, except for said final heating zones, to substantially prevent make-up fluid from entering such heating zones from any source other than said fluid flow communication means.

3,923,450
ROTARY KILN PROVIDED WITH SEAL MECHANISM

Kimio Inoue; Seiichi Hirano; Tamiharu Sakai, all of Kobe, and Yasokazu Ikuno, Osaka, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed May 28, 1974, Ser. No. 473,575
Claims priority, application Japan, May 31, 1973, 48-64399
Int. Cl.² F27B 7/024
U.S. Cl. 432—115 4 Claims



1. A rotary kiln provided with a seal mechanism, comprising:

a rotary kiln proper;

a hood covering one end portion of said rotary kiln proper;

a seal mechanism providing a seal between said rotary kiln proper and said hood which has metal rings, packings, and means for lubricating the sliding faces of said metal rings and packings;

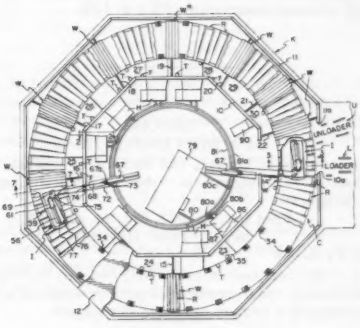
an elastic means for supporting the weight of the hood independently of said rotary kiln proper; and

a position-adjusting means connected to said elastic means for vertically adjusting the hood supported thereby.

3,923,451
CONTINUOUS TUNNEL KILN FOR CURING MOLDED CONCRETE PRODUCTS

Robert J. Woelk, Alpena, Mich., assignor to Besser Company, Alpena, Mich.

Continuation-in-part of Ser. No. 394,470, Sept. 9, 1973, abandoned. This application Aug. 1, 1974, Ser. No. 493,928
Int. Cl.² F27B 9/16
U.S. Cl. 432—138 26 Claims



1. In a system for curing molded concrete products such as green concrete blocks supported on pallets;

a circular tunnel structure having inner, outer and top walls defining an essentially closed passageway except for ends at which loading and unloading can be accomplished;

a carousel, comprising circumferentially spaced carriers, with vertically spaced, generally radially extending shelf members for supporting the products, disposed for indexing rotary travel in said passageway;

said carriers having a substantially imperforate inner and outer end wall, a substantially imperforate bottom wall, a substantially imperforate radial wall, and a substantially imperforate top wall, but being sidewisely open;

circumferentially spaced groups of circumferentially spaced resilient wiper blades mounted by said tunnel structure along the top, bottom, and inner and outer ends of the pathway of said carriers to extend into the path of said carriers and form sealed compartments between said groups as a result of carriers being stopped in indexed position at a series of circumferentially spaced locations in said tunnel structure, radially opposite said groups, said groups of blades being spaced apart a distance equal to a multiple of the distance between the radial walls of said carriers;

means for introducing curing steam into certain compartments; and

means for indexing the carousel in predetermined increments to always dispose carriers radially opposite said wiper blades at said spaced locations.

3,923,452

AMINE SALT OF A DYESTUFF IN A KETONE SOLUTION

Jacques Wegmann, Bettingen; Carl Becker, Basel; Guenther Zwahlen, Dornach, and Werner Kuster, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 94,947, Dec. 3, 1970, abandoned. This application Apr. 5, 1973, Ser. No. 348,383

Claims priority, application Switzerland, Dec. 3, 1969, 18045/69; Jan. 8, 1970, 156/70; Jan. 30, 1970, 1297/70

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] D06P *1/10*

U.S. Cl. 8—1 XA 5 Claims

1. A dyestuff preparation consisting essentially of a dispersion or solution of 5 to 75% by weight of a water-insoluble amine salt of a dyestuff selected from the group consisting of 1:2 chromium complex of an azo dyestuff, 1:2 chromium complex of a formazane dyestuff, phthaolcyanine dyestuff, diazine dyestuff, and anthraquinone sulfonic acid dyestuff, in an aliphatic or cycloaliphatic ketone having a solubility in water at room temperature of 0.1 to 10%.

3,923,453

NEW DYE COMPOSITIONS

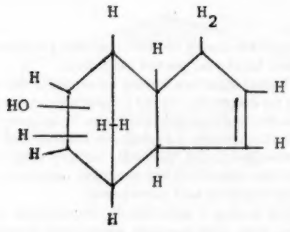
Remus I. Lazar, Berwyn, and Richard C. Reichel, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Dec. 3, 1973, Ser. No. 420,998

Int. Cl.[2] D06P *1/20, 5/04*

U.S. Cl. 8—39 5 Claims

1. A dye composition comprising one part by weight of an acid dyestuff and from one to 20 parts by weight of a dye assist consisting of a mixture of benzyl alcohol and



having a boiling point of about 117°C at 9 mm Hg pressure, a refractive index of about 1.5262 at 20°C and an infrared spectrum having strong bands at about 9.4, 10.1, 12.7 and 14.4 microns, in a weight ratio of from 4:1 to 1:4.

3,923,454

POLYESTER AND PLASTIC DYES

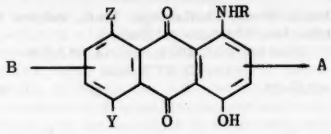
Guido R. Genta, Snyder, N.Y., assignor to American Aniline Products, Inc., Paterson, N.J.

Division of Ser. No. 299,398, Oct. 20, 1972, Pat. No. 3,840,567. This application May 7, 1974, Ser. No. 467,721

Int. Cl.[2] C09B *1/50;* D06P *1/20*

U.S. Cl. 8—39 6 Claims

1. A polyester fabric material dyed with a halogenated mixture of a compound of the formula:



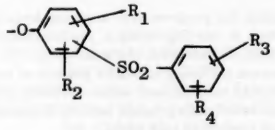
wherein

R is hydrogen or lower alkyl;

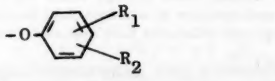
one of Y and Z is independently hydroxy, amino or lower alkylamino; and the other

of Y and Z is hydroxy;

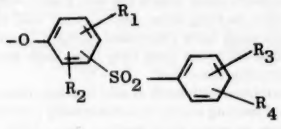
one of A and B is an arylsulfonyl group of the formula



and the other of A and B is hydrogen,



or



A and B each being ortho to a hydroxy group,

each of R_1 and R_2 is independently hydrogen, chlorine, bromine, lower alkyl or lower alkoxy; and

each of R_3 and R_4 is independently hydrogen, chlorine, bromine, lower alkyl, or nitro;

each aminoanthraquinone of the mixture having bonded to aromatic carbon atoms thereof between 0.001 and 4.0 chlorine or bromine atoms, wherein said chlorine or bromine is introduced at a position on said aminoanthraquinone through a Friedel Crafts reaction.

3,923,455

PROCESS OF DYEING AND PRINTING SYNTHETIC HYDROPHOBIC MATERIALS WITH WATER-INSOLUBLE MONOAZO DYES

Dieter Cornelius, Darmstadt-Arheilgen, and Hanswilli von Brachel, Leopoldshohe, both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

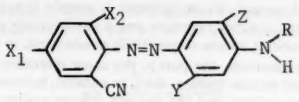
Continuation of Ser. No. 92,844, Nov. 25, 1970, abandoned. This application July 31, 1973, Ser. No. 384,273

Claims priority, application Germany, Apr. 24, 1970, 2020030

Int. Cl.[2] D06P *1/04*

U.S. Cl. 8—41 B 4 Claims

1. A process which comprises dyeing or printing a hydrophobic synthetic material selected from the group consisting of linear polyesters, acetyl cellulose, polyamides and polycarbonates with a dyestuff of the formula



wherein X_1 is nitro, cyano or alkylsulfonyl having from 1 to 4 carbon atoms; X_2 is alkylsulfonyl having 1 to 4 carbon atoms; Y is alkanoylamino having 2 to 5 carbon atoms; Z is hydrogen or alkoxy having 1 to 4 carbon atoms and R is alkyl having 1 to 4 carbon atoms or mono-substituted alkyl wherein said alkyl moiety has from 1 to 4 carbon atoms and said substituent is cyano, acetoxy, hydroxy, methoxycarbonyl, ethoxycarbonyl, phenyl, methylsulfonyl, ethylsulfonyl or nitro.

3,923,456
METHOD OF WASHING TEXTILE MATERIALS WITH SURFACE-ACTIVE AGENT AND CATALYST-CONTAINING MICELLES

John W. Willard, Sr., Rapid City, S. Dak., assignor to Caw Industries, Inc., Rapid City, S. Dak.

Continuation-in-part of Ser. No. 317,097, Dec. 20, 1972, which is a continuation of Ser. No. 108,198, Jan. 20, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,542
Int. Cl.² D06F *11/00*
U.S. Cl. 8—137.5 **18 Claims**

1. In a method of washing soil from soiled textile material wherein the textile material is intimately contacted with water containing a surface active agent, the improvement in combination therewith comprising

washing the soil from the soiled textile material with water containing the said surface active agent and a catalyst, the catalyst being present in a catalytically effect amount which increases the rate of removal of the soil from the textile material,

the catalyst being prepared by a process comprising

admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0,

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 0.9:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 mole per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous colloidal suspension of particles of the reaction product,

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said colloidal particles upon agitating the aqueous medium, and

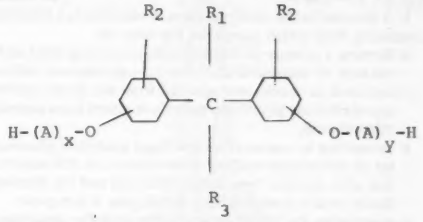
agitating the aqueous medium containing the colloidal particles and surfactant to form said catalyst micelles.

3,923,457
MIXTURES OF FIXING AUXILIARIES CONTAINING NOVEL DYE CARRIER

Sienling Ong, Lorsbach, Taunus; Max Grossmann, and Ulrich Karsunky, both of Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 10, 1973, Ser. No. 405,038
Claims priority, application Germany, Oct. 12, 1972, 2250017
Int. Cl.² D06P *1/60, 5/04;* **C09B** *67/00*
U.S. Cl. 8—169 **2 Claims**

1. A mixture of fixing auxiliaries consisting of: (1) an oxalkylated bisphenol A derivative of the formula



wherein R_1 is hydrogen or methyl, R_2 is hydrogen or alkyl having 1 to 12 carbon atoms, R_3 is hydrogen or alkyl having 1 to 18 carbon atoms, A is oxyethylene and/or oxypropylene and *x* and *y* are numbers the sum of which is between 4 and 50, (2) an oxethylated fatty alcohol of the formula

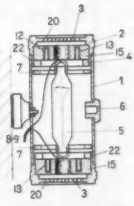
$$R-O-(C-CH_2-CH_2-O)_z-H$$

wherein R is alkyl or alkenyl having 6 to 18 carbon atoms and *z* is a number from 4 to 25, and (3) polyethylene glycol having 2 to 25 units of ethylene oxide.

3,923,458
AIR TREATMENT DEVICE

Gonzalo Moran, Madrid, Spain, assignor to Comercial Super-Dix, S.A., Madrid, Spain

Filed Sept. 26, 1972, Ser. No. 292,309
Int. Cl. A61l *9/02*
U.S. Cl. 21—74 R **3 Claims**



1. An air treatment device for perfuming, deodorizing and purifying air comprising, a tubular casing, grate means at each end of said casing providing communication between the interior of said casing and the atmosphere, a respective holding means axially spaced from each said grate means, a cake of solid carrier material carrying thereon a heat activated gasifiable, air-treatment material mounted on each said holding means adjacent a said grate means, an electrically activated lamp within said casing adjacent said cakes of carrier material to heat said carrier material and liberate the treatment material therein which passes through the respective grate means to the area adjacent the casing, means for connecting said lamp to an electrical power source, and means in

said casing through which the lamp is viewable to determine if the device is energized.

3,923,459
PROCESS FOR THE DETERMINATION OF BILIRUBIN IN FLUIDS

Gerhard Ertingshausen, New York, and Diane F. Byrd, Tarrytown, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 14, 1972, Ser. No. 314,977

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G01N *33/16*; **C07C** *113/00*

U.S. Cl. 23—230 B **12 Claims**

1. A process for the determination of bilirubin in a bilirubin-containing fluid which comprises the steps of:

a. forming a mixture of said bilirubin-containing fluid and a mixture of diazosulfanilic acid-1,5-naphthalene disulfonate and an accelerator selected from the group consisting of ethylene glycol and propylene glycol in an aqueous mineral acid;

b. measuring by means of a centrifugal analytical photometer an absorbance reading of the mixture at 550 nanometers after reaction between the bilirubin and the diazosulfanilic acid-1,5-naphthalene disulfonate is complete;

c. comparing the absorbance reading with the absorbance reading obtained simultaneously under the same conditions from a mixture containing a known concentration of bilirubin; and

d. determining the amount of bilirubin in said bilirubin-containing fluid.

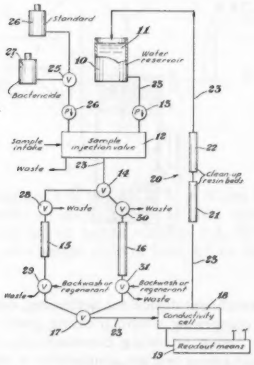
3,923,460
DUAL ION CHROMATOGRAPH USING PARALLEL COLUMNS FOR IONIC ANALYSIS

Albert Ross Parrott, and Donald Clarence Benefiel, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 12, 1974, Ser. No. 523,091

Int. Cl.² G01N *27/08*, *31/04*, *31/08*

U.S. Cl. 23—230 R **12 Claims**



1. Chromatographic apparatus for the concurrent quantitative determination of chromatographically separable cations and anions in aqueous solution from a single measured portion of sample solution which comprises:

first and second tubular columns each adapted to hold a charge of ion exchange resin;

first and second stream splitters, a sample selection valve, a pump, a water reservoir and a conductivity cell; and

liquid conduit means sequentially connecting, in series, the water reservoir, the pump, the same selection valve and the first stream splitter, then, in parallel, between the first stream splitter and the second stream splitter, the first and second tubular columns, and finally, in series, the second stream splitter and the conductivity cell.

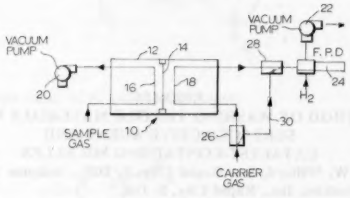
3,923,461
APPARATUS AND METHOD EMPLOYING GAS-PERMEABLE MEMBRANE FOR SEPARATING, DILUTING, OR CONCENTRATING MOLECULAR SPECIES

James D. Barden, Nokesville, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Filed June 7, 1974, Ser. No. 477,463

Int. Cl.² B01D *13/00*, *53/22*; **G01N** *31/12*

U.S. Cl. 23—232 R **10 Claims**



1. Apparatus for controlling the concentration of sample fluid species in a carrier fluid supplied to a device utilizing said species, which comprises means providing a fluid permeable wall separating sample fluid flow and carrier fluid flow paths at opposite sides thereof, means for connecting said carrier fluid flow path to said device downstream of said apparatus, means for supplying sample fluid to said sample fluid flow path, means for supplying a carrier fluid stream to said carrier fluid flow path and then to said device, and means for interrupting the flow of carrier fluid in the last-mentioned path from time to time and for reinstituting that flow, whereby sample species which permeate said wall during the time of carrier fluid interruption accumulate at the carrier fluid side of said wall until the carrier fluid flow from said stream to said device is reinstituted.

3,923,462
PHOTOGRAPHIC DETECTION AND INTEGRATION OF LIGHT EMITTED FROM LUMINESCENT REACTIONS

Leonard Alan Cavanagh, San Jose, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed June 17, 1974, Ser. No. 480,043

Int. Cl.² G01N *31/22*, *21/12*

U.S. Cl. 23—232 R **15 Claims**

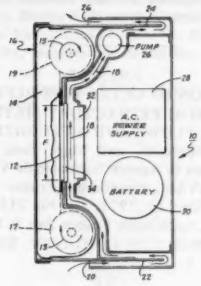
12. The method of detecting the presence of a given substance in a fluid and producing an indication of the amount of the given substance present over a given time period, comprising:

positioning a material which produces light in the presence of the said substance to be detected in a light-tight enclosure;

positioning a photographic film in the said enclosure in spaced-apart but exposed relation with respect to said material, whereby said film is exposed by light produced by interaction of said substance and material; and

developing said photographic film thereby to provide an

observable indication of its state of exposure and, hence, an indication of the amount of the said substance present



over the time interval of exposure of said film to the said material.

3,923,463

APPARATUS FOR PERFORMING CHEMICAL AND BIOLOGICAL ANALYSIS

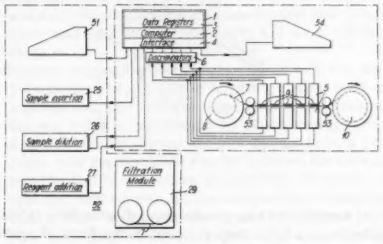
Kenneth Dawson Bagshawe, 115 George St., Marble Arch, London WC2, and James Edward Kemble, 80 Park Road, Burgess Hill, Sussex, both of England

Filed Oct. 9, 1973, Ser. No. 404,720

Claims priority, application United Kingdom, Oct. 9, 1972, 46521/72

Int. Cl.² G01N *31/00*; G01T *1/00*

U.S. Cl. 23—253 R **9 Claims**



1. Apparatus for analysing a plurality of liquid samples, each sample being in a tube, and comprising a cassette having a shell in which a plurality of such tubes are to be contained in sequence, said cassette having apertures in its walls through which means, operated by apparatus external to the cassette, actuate and advance the tubes sequentially and stepwise past a fixed point, said cassette being freely removable from the operating apparatus, without disturbing the contained tubes, to other locations, the initial sequence of tubes being maintained throughout.

3,923,464

COMBUSTION APPARATUS FOR ANALYTICAL INSTRUMENTS

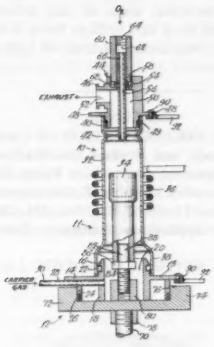
George J. Sitek, Stevensville, and Robert N. Revesz, St. Joseph, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Sept. 25, 1972, Ser. No. 291,763

Int. Cl.² G01N *31/12*; F15D *1/00*

U.S. Cl. 23—253 PC **10 Claims**

1. A combustion furnace for analytical apparatus comprising an induction coil with a vertically extending axis, a combustion tube mounted within said coil, an upper closure member for sealably coupling to an upper end of said combustion tube, said upper closure member including an exhaust gas passage therethrough, and a separate aperture extending through said upper closure member along the vertical axis thereof, a lower closure member for sealably engaging the lower end of said combustion tube, said lower closure member including a passageway extending therethrough to define a carrier gas inlet communicating with the interior of said combustion tube and crucible supporting means associated with said lower closure member, said lower closure member movable between a first position sealing said lower end of said combustion tube and supporting a crucible within the field of said coil and a second position displaced therefrom, a combustion gas lance, and means in said upper closure members for securing said lance in said separate aperture for optimal delivery of combustion gas into said crucible within said field.



3,923,465

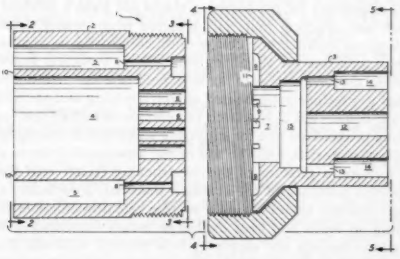
APPARATUS FOR PRODUCING CARBON BLACK

Joseph C. Krejci, Phillips, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 1,432, Jan. 8, 1970, Pat. No. 3,867,513. This application Apr. 18, 1974, Ser. No. 462,108

Int. Cl.² C09C *1/48*

U.S. Cl. 23—259.5 **1 Claim**



1. In a carbon black reactor, a nozzle comprising a surrounding first wall means forming a mixing chamber; a second wall means having a plurality of inlet conduit means opening into said mixing chamber, said inlet conduit means comprising a plurality of centrally positioned first inlet conduits and a plurality of second inlet conduits positioned peripherally to said first inlet conduits, said second inlet conduits being provided with discharge ends which enter said mixing chamber in generally radially inwardly extending directions so that fluid

introduced through said second inlet conduits converges toward fluid introduced through said first inlet conduits to provide mixing in said mixing chamber; third wall means contianing at least one central discharge conduit opening from said mixing chamber, a plurality of second discharge conduits opening from said mixing chamber and being positioned peripherally to said central discharge conduit, each of said second discharge conduits having an orifice in the inlet thereof, the total cross-sectional area of said orifices in said second discharge conduits being substantially equal to the cross-sectional area of said at least one central discharge conduit, the total of the cross-sectional areas of said second discharge conduits downstream from said orifices being from about 2 to about 6 times the cross-sectional area of said at least one central discharge conduit.

3,923,466

APPARATUS FOR THE PRODUCTION OF CRACKED GAS

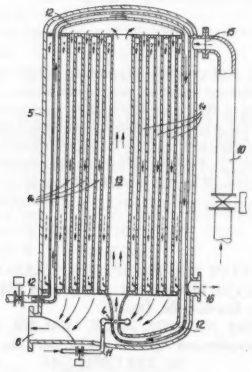
Henri F. Seelig, Essen, and Herbert von Waclawiczek, Duisburg, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Dec. 18, 1972, Ser. No. 316,426

Claims priority, application Germany, Dec. 16, 1971, 2162390

Int. Cl.[2] B01J *1/00, 8/06;* **C07C** *1/02*

U.S. Cl. 23—284 **8 Claims**



1. Apparatus for producing cracked gas from a mixture of steam and reaction materials selected from among organic carbon and hydrocarbon compounds, comprising, in combination: a feed line for supplying steam from a nuclear reactor, heating means connected to said feed line for heating said steam to produce superheated steam; a mixing and atomizing nozzle connected to a source of reaction materials and connected to said feed line for supplying steam for atomizing such reaction materials with the aid of the superheated steam and for forming a mixture of the superheated steam with finely dispersed particles of the reaction material; a vertically oriented reaction vessel having a tubular reaction chamber containing an input and heat exchange means surrounding said reaction chamber and supplying heat thereto, with said atomizing nozzle being disposed at the input of said tubular reaction chamber and connected thereto by a flaring end for feeding the resulting mixture into said tubular reaction chamber where the superheated steam and the reaction material substantially react to produce cracked gas; means associated with said vessel for conducting cracked gas and any remaining mixture out of said tubular reaction chamber and through said heat exchange means where the remaining mixture is reacted to complete production of the cracked gas; intake means connected to said heat exchange means for feeding nuclear reactor coolant into said reaction vessel for supplying heat to said vessel, said heat exchange means being arranged for passing the coolant around the tubular reaction chamber; and outlet means connected to said heat exchange means for removing the coolant.

3,923,467

PRODUCTION OF ULTRA FINE REFRACTORY PARTICLES FROM REFRACTORY MATERIAL USING PLASMA FLOWS AND A FLUIDIZED BED

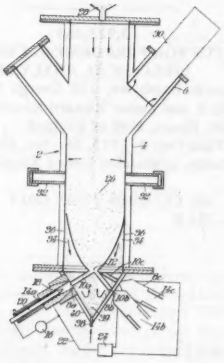
Claude Bonet, Montlouis, and Marc Foex, Paris, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Courbevoie, France

Filed Dec. 28, 1971, Ser. No. 213,052

Claims priority, application France, Jan. 6, 1971, 71.00184

Int. Cl.[2] B01D *5/00;* **C01G** *25/02;* **B01D** *7/00*

U.S. Cl. 23—293 A **9 Claims**

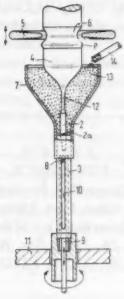


1. A method for the production of ultra fine refractory particles from a refractory material in the form of relatively coarse particles which comprises generating a plurality of upwardly directed plasma flows in the lower portion of a vertical enclosure, the direction of said plasma flows being oriented to converge at a point substantially at the vertical axis of said enclosure to form a principal flow of hot gases moving upwards, said gases having a temperature above the vaporization temperature of said refractory particles, causing an electric current to flow through said convergent flows in an arc across the bottom of the enclosure at an energy level of at least about 38.5 kw, introducing said refractory coarse particles by gravity into said principal flow of hot gases above said point of convergence, controlling the orientations and the flow rates of said plasma flows and the electrical energy dissipated therein to impart to said principal flow a flared shape terminating in a cross-section substantially equal to the internal diameter of said enclosure, said plasma flows having a sufficiently reduced speed so as to form a fluidized bed of said refractory particles therein, and to ensure that the hot gases have a temperature higher than the vaporization temperature of said refractory material, controlling the rate of introduction of said refractory material in said plasma flow to allow for the vaporization of at least part of said coarse refractory particles in the fluidized bed, and removing hot gases containing vaporized refractory materials and fine refractory particles entrained therein from above said fluidized bed.

3,923,468
METHOD FOR CRUCIBLE-FREE ZONE MELTING OF SEMICONDUCTOR CRYSTAL RODS

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 20, 1974, Ser. No. 525,641
Claims priority, application Germany, Nov. 22, 1973, 2358300
Int. Cl.² B01J 17/10
U.S. Cl. 23—301 SP 3 Claims



1. A method of crucible-free zone melt processing of a semiconductor crystal rod comprising:

arranging a semiconductor crystal rod within a crucible-free zone melt environment with a seed crystal attached to a lower end thereof;

generating a melt zone at the juncture of said seed crystal and said rod and controllably moving said melt zone away from said juncture through said rod to a select point thereon;

uniformly supporting said lower end of said rod so as to prevent oscillations at the juncture of said seed crystal and said rod; said uniform supporting of said lower end of the rod being accomplished by axially upwardly moving a hollow funnel-shaped support means from a position below said juncture between the between the seed crystal and the rod to a position surrounding the lower end of said rod; said support means comprising a funnel-shaped casing filled with a granular material selected from the class consisting of silicon, quartz, sand and metal spheroids, said material being self-adjusting to contact all points about the circumference of the lower end of said rod so as to dampen any oscillation between the rod and the seed crystal; and

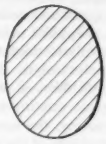
controllably moving said melt zone from said select point through the remaining portion of said rod.

3,923,469
ONE-FOLD UNITARY STEEL SUCKER ROD STRING

Alexander Palynchuk, Edmonton, Canada, assignor to Corod Manufacturing Ltd., Edmonton, Canada

Continuation of Ser. No. 285,572, Sept. 1, 1972, abandoned, which is a division of Ser. No. 36,107, May 11, 1970, Pat. No. 3,689,326. This application Jan. 9, 1975, Ser. No. 539,826
Int. Cl.² B21C 37/00
U.S. Cl. 29—183.5 9 Claims

1. A onefold unitary steel sucker rod string, several thousands of feet in length, produced from rods of circular cross section, between about three-fourths inch to about seven-eights inch in diameter to a rod having an oval cross section substantially completely throughout its length and formed into a tight coil, said string having a minor diameter of about 0.570 inch to about 0.670 inch in the coil plane, said coil being of

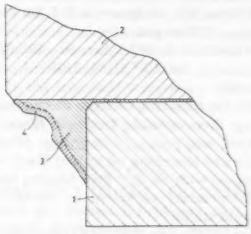


sufficiently large inside diameter whereby the rod string is not stressed beyond its 0.2 offset yield.

3,923,470
SOLDERED JOINT

Cornelis Jan Damsteeg, Leende, and Tjepke Hendrik Ekkelboom, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 27, 1973, Ser. No. 373,943
Claims priority, application Netherlands, July 4, 1972, 7208332
Int. Cl.² B23P 3/22
U.S. Cl. 29—191 2 Claims



1. A soldered joint between articles consisting mainly of at least one of the high melting point metals, high melting point metal carbides and high melting point metal oxides, which joint comprises titanium, wherein at least the external surface layer of the soldered joint consists of titanium nitride.

3,923,471
LUBRICATED METALLIC CONTAINER STOCKS AND METHOD OF PREPARING THE SAME AND APPLYING AN ORGANIC COATING THERETO

John R. Smith, Richmond, and James A. Bray, Salineville, both of Ohio, assignors to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 233,748, March 10, 1972, Pat. No. 3,826,675. This application May 13, 1974, Ser. No. 469,542
Int. Cl.² B32B 15/04
U.S. Cl. 29—195 32 Claims

1. A metallic container stock having a thin substantially uniform film of citric acid ester lubricant on at least one surface area thereof, the citric acid ester lubricant consisting essentially of at least one citric acid ester of an alcohol containing 1–10 carbon atoms and being present in an amount of about 0.05–1.0 gm for each 62,720 square inches of lubricated surface area, the container stock being electrolytic tinplate having thereon a chromium-containing film contiguous with the tin surface, the chromium-containing film being cathodically deposited on the electrolytic tinplate from an aqueous hexavalent chromium electrolyte.

17. In a method of applying an organic coating to electrolytic tinplate container stock which has thereon a chromium-containing film contiguous with the tin surface, the chromium-

containing film being cathodically deposited on the electrolytic tinplate container stock from an aqueous hexavalent chromium electrolyte, in which method a layer of an initially fluid organic coating material selected from the group consisting of fluid varnishes, lacquers and enamels for the electrolytic tinplate container stock is applied to at least a portion of the surface area of the electrolytic tinplate container stock, the said surface area of the electrolytic tinplate container stock having a film of a lubricant thereon, and thereafter the layer of the initially fluid organic coating material is hardened to form the said organic coating, the improvement which comprises improving the wettability of the said surface area of the electrolytic tinplate container stock by the initially fluid organic coating material by employing thereon as the lubricant a substantially uniform film of a citric acid ester, the citric acid ester consisting essentially of at least one citric acid ester of an alcohol containing 1–10 carbon atoms and being present in an amount of about 0.05– 1.0 gm for each 62,720 square inches of lubricated surface area of the container stock.

3,923,472

FUEL MADE FROM THERMOPLASTIC FIBERS AND OIL

Boni Philip Martinez, Wilmington, Del., and Millard David Zeisberg, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 5, 1973, Ser. No. 403,863
Int. Cl.[2] C10L *1/00*
U.S. Cl. 44—50 **8 Claims**

1. A process for removing oil from the surface of water and for converting thermoplastic synthetic fibers into a liquid suitable for fuel, said process comprising: placing said fibers on said surface and absorbing oil by said fibers until said fibers become saturated with oil and then heating the oil saturated fibers to a temperature sufficient to change said saturated fibers to a liquid state.

5. A process for filtering with and converting thermoplastic synthetic fibers into a liquid suitable for fuel, said process comprising: passing an oil-bearing liquid mixture through said fibers until said fibers become saturated with oil and then heating the oil saturated fibers to a temperature sufficient to change said saturated fibers to a liquid state.

3,923,473

CARBON RESIDUE INHIBITOR FOR DISTILLATE FUELS

Charles A. Sandy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 16, 1973, Ser. No. 416,598
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C10L *1/20*
U.S. Cl. 44—62 **10 Claims**

1. A fuel oil composition comprising a fuel oil that boils in a range from about 250°F. to 800°F., and at least one member selected from the oil-soluble polymer group

i. halogen-containing polypropylene
ii. halogen-containing polybutylene
iii. halogen-containing copolymer of propylene and butylene

wherein the polymer has a molecular weight from about 400 to 3,000 and contains from about 0.1% to 25% by weight of halogen, the halogen being selected from the group chlorine and bromine, the polymer being present at a concentration from about 0.004 to 0.4 percent weight of the composition.

3,923,474

ALKYLDIAMINOAMIDS OF FATTY ACIDS AS GASOLINE ADDITIVES

Joseph B. Yount, Newark, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Nov. 11, 1974, Ser. No. 522,709
Int. Cl.[2] C01L *1/22*
U.S. Cl. 44—66 **4 Claims**

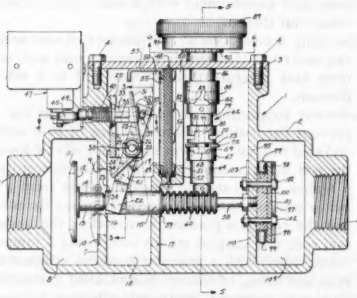
1. A gasoline fuel composition comprising from 0.003 to 0.15 percent by weight of a dual additive combination consisting of at least one compound having the general formula A: $RNHCH_2CH_2CH_2NHCOR'$ and at least one compound of the general formula B: $R''OCH_2CH_2CH_2NHCH_2CH_2CH_2—NHCOR'$, wherein R is an aliphatic hydrocarbon radical having 10–20 carbon atoms; R′ is an aliphatic hydrocarbon radical having 9–19 carbon atoms; and R″ is an aliphatic hydrocarbon radical having 10–15 carbon atoms in said formulas.

3,923,475

FIRECHECK

Wallace I. Stenzel, Thiensville; Frederick W. Kufrin, Janesville, and Donald J. Allen, Fort Atkinson, all of Wis., assignors to Waukee Engineering Co., Milwaukee, Wis.

Filed Oct. 25, 1973, Ser. No. 409,401
Int. Cl.[2] F16K *17/38, 31/54;* **F17D** *3/00;* **F23D** *13/46*
U.S. Cl. 48—192 **24 Claims**



1. A firecheck adapted to be connected in a combustible fuel line, comprising a casing having an inlet and an outlet, a burner screen located within the casing between the inlet and the outlet, control valve means disposed within the casing between the inlet and the burner screen, opening means for moving the valve means to the open position, locking means for locking the valve means in the open position, biasing means for moving the valve means to the closed position on release of said locking means, means responsive to burning of the combustible gas on the downstream side of the screen to render said locking means ineffective and enable said biasing means to move the valve means to the closed position, said casing including aperture means located between the screen and the outlet, and movable check gate means for opening and closing said aperture means, said check gate means being normally in an open position and disposed to be moved to the closed position under the force of shock wave from a detonation downstream of said firecheck.

3,923,476

METHOD OF PRODUCING COATED ABRASIVE PARTICLES

Alexander Rose Roy, 16 Cecil St., Meredale, Johannesburg, Transvaal, and Johannes Daniel Van Schalkwyk, 904 Total Centre, Braamfontein, Johannesburg, Transvaal, both of South Africa

Filed Jan. 14, 1974, Ser. No. 433,242

Claims priority, application South Africa, June 5, 1973, 73/3773; Jan. 22, 1973, 73/0450

Int. Cl.² B24D *3/06, 3/28*

U.S. Cl. 51—295 8 Claims

1. A method of producing coated abrasive particles for use in the manufacture of a resin-bonded abrasive tool in which the coating comprises an inner metallic layer and an outer solid resin protective layer, which method comprises the steps of providing a batch of particles coated with a metal selected from the group consisting of nickel and copper present in an amount from 20 to 80% by weight of the coated particle, removing metal oxides from the exposed surfaces of the particles, immediately thereafter depositing on the particles, before reoxidation of the exposed surfaces thereof occurs, a protective layer of a solid resin selected from the group consisting of phenolformaldehyde, epoxy, polyimide, alkyd, nonsaturated polyester and polyamide in an amount from 1 to 3% by weight of the coated particle, and recovering the particles as discrete particles having a metal/protective layer coating.

3,923,477

ADSORPTION SYSTEM

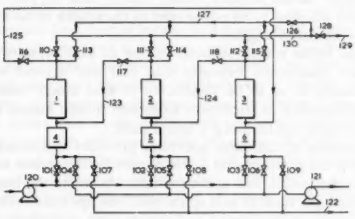
John Walter Armond, Great Bookham, and David Arthur Webber, Bishops Stortford, both of England, assignors to The British Oxygen Company Limited, London, England

Filed Oct. 22, 1974, Ser. No. 516,987

Claims priority, application United Kingdom, Oct. 23, 1973, 49567/73

Int. Cl.² B01D *53/02*

U.S. Cl. 55—25 15 Claims



1. An adsorption process for increasing the proportion of a desired gas in a mixture of which it is a constituent which comprises the sequential step of passing the gas mixture at a pressure in the range 1.1 to 10.0 bars through an adsorption bed that preferentially adsorbs one or more other constituents of the mixture, returning the bed to atmospheric pressure by venting the absorbed gas in a direction counter to the direction of passing the gas mixture, evacuating residual gas from the bed by means of a vacuum pump in the same direction as the venting, restoring the adsorption pressure in the bed by introducing gas of the desired product quality in the same direction as the venting, introducing in the same direction as the gas mixture a partly enriched gas having a content of the desired gas less than the desired product but greater than the gas mixture and then repeating the sequence.

3,923,478

PROCESS AND AN APPARATUS FOR RECOVERING ARSENIC TRIOXIDE FROM GASES

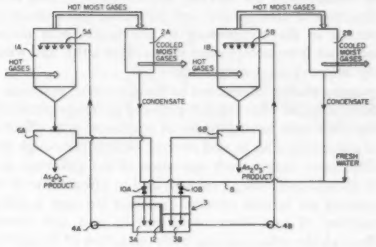
Utz Gerhard Fiedler, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Feb. 11, 1974, Ser. No. 441,385

Claims priority, application Sweden, Feb. 14, 1973, 7302076

Int. Cl.² B01D *47/00*

U.S. Cl. 55—68 8 Claims



1. In a process for recovering arsenic trioxide from a gas washing out said oxide from the gas with a liquid having the ability of dissolving arsenic trioxide, said oxide being recovered from the obtained solution thereof by crystallization from a saturated solution, the improvement which comprises removing non-desirable deposits in the apparatus formed in connection with the saturated solution by dissolution with an unsaturated solution of arsenic trioxide in a closed system and under a continuous supply of gas.

3,923,479

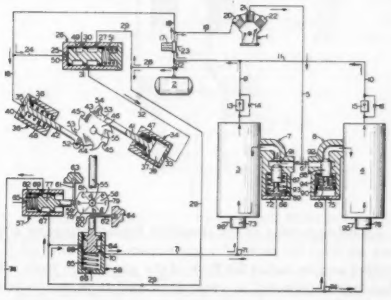
MULTIPLE FILTER APPARATUS

William H. Glass, and Robert J. Bridigum, both of Pittsburgh, Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sept. 21, 1973, Ser. No. 399,624

Int. Cl.² B01D *53/04*

U.S. Cl. 55—163 8 Claims



1. In an apparatus for a compressed air system including an air compressor, a reservoir connected to filter units and to the compressor for storing compressed air therefrom, and a governor device connected to the reservoir and the compressor and operable cyclically and alternately responsively to compressed air in the reservoir at a certain high pressure to an unloading position for unloading the compressor and to compressed air in the reservoir at a certain low pressure to a loading position for loading the compressor:

a. a plurality of conduit means arranged in parallel relation with each other and each having interposed therein re-

spective parallel choke and one-way check valve means via which compressed air may flow in one direction at an unrestricted rate from the compressor to the reservoir and in a reverse direction at a restricted rate from the reservoir;

b. a plurality of filter units interposed respectively in said plurality of conduit means between the compressor and the respective choke and check means, said filter units including means for filtering and accumulating moisture from compressed air flowing therethrough in said one direction and being purged of such accumulated moisture by compressed air flowing therethrough in said reverse direction to atmosphere, and including valve means connected to the compressor to alternately pass moisture laden air from compressor to the filter units; and wherein the improvement comprises:

c. purging means connected to the governor, reservoir and filter units for effecting filtering and purging operations of the filter units in such order of operation as to effect flow of compressed air in said reverse direction through all the filter units during each operation of the governor device to its said unloading position, and to effect flow of compressed air in said reverse direction through a selected number of said filter units and in said one direction through the others during each operation of the governor device to its said loading position.

3,923,480

OIL SEPARATOR

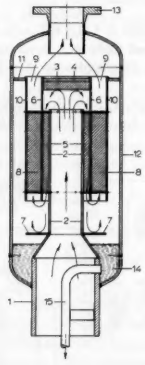
Tonny Dirk Henricus Visch, Weesp, Netherlands, assignor to James Howden Holima B.V., Amsterdam, Netherlands

Filed Apr. 18, 1973, Ser. No. 352,451

Claims priority, application Netherlands, Apr. 19, 1972, 7205226

Int. Cl.[2] B01D 47/00

U.S. Cl. 55—257 **9 Claims**



1. An oil separator of the demister type comprising a tank having an inlet for flow of a gas stream containing oil to be separated and an outlet for flow of the gas stream from which oil has been separated, a conduit in said tank connected to said inlet for conveying the gas stream into the tank, said conduit having an open outlet in said tank, a baffle in said tank facing said outlet for reversing the direction of flow of the gas stream, means defining first and second passages in said tank for flow of the gas stream therethrough, a first demister pack in said first passage having an inlet facing said baffle for flow of the reversed gas stream therethrough and an outlet for exit of the gas stream, said first demister pack operating in supersaturated condition and extracting oil from said gas stream passing therethrough, a second baffle in said tank facing the outlet of said first demister pack to effect a second reversal of the gas stream, a second demister pack in said second passage having an inlet facing said second baffle for flow of the gas stream therethrough after the second reversal of said gas stream and an outlet for exit of the gas stream connected to said outlet of the tank, said second demister pack operating in unsaturated condition and extracting oil from said gas stream, and means in said tank for collecting oil extracted by said first and second demister packs.

3,923,481

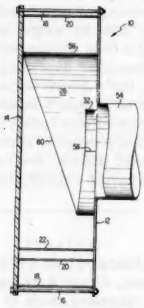
TURB-O-AIR SEPARATOR

Desmond J. Farrow, North East, Md., assignor to Turb-O-Jector, Inc., Nottingham, Pa.

Filed July 5, 1974, Ser. No. 486,228

Int. Cl.[2] B01D 45/12

U.S. Cl. 55—398 **4 Claims**



1. An air separator for internal combustion engines comprising:

a first support means;

a second support means fixedly connected to said first support means;

intake means interposed between said first and second support means;

exhaust means defined within one of said support means and adapted to be connected to the intake of an internal combustion engine;

spiral baffle means secured to one of said support means and interposed between said first and second support means so as to be connected to said intake means for conducting an airstream from said intake means to said exhaust means along a spiral path;

a plurality of discharge apertures provided within the outer and inner peripheral walls of said baffle means so as to permit serial fluid communication between the inner and outer portions of said spiral path, the aperture within said outermost peripheral wall being open externally of said separator;

said baffle means comprising a plurality of serially arranged baffles arcuately spaced so as to define said apertures between said successive ones of said baffles, the axial extent of the innermost baffle of said serially arranged baffles being convergent toward said one of said support means and said exhaust means defined therein so as to permit the air to be exhausted to said engine through said exhaust means to be guided both radially inwardly and axially toward said exhaust means while simultaneously permitting dirt and dust particles to be conducted, under the influence of centrifugal force, radially outwardly over said innermost baffle and from that portion of said separator disposed radially within said innermost baffle towards the radially outer portions of said separator,

wherein dirt and dust particles will be discharged out of said separator under the influence of centrifugal force by successively migrating about said inner and outer portions of said spiral path as well as serially from said inner

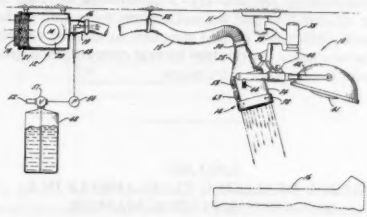
portions of said spiral path to said outer portions of said spiral path so as to be ultimately discharged out of said separator through said aperature within said outermost peripheral wall while clean air is conducted to said exhaust means through said spiral path.

3,923,482

CLEAN AIR DIRECTING APPARATUS

James V. Knab, Grand Rapids; Charles Haeckler, Cannonsburg; John Bell, and Jerry Fellinger, both of Grand Rapids, all of Mich., assignors to James V. Knab, Grand Rapids, Mich.

Filed Apr. 12, 1972, Ser. No. 243,308
Int. Cl.[2] F24F *9/00, 13/08*
U.S. Cl. 55—412 **13 Claims**



12. Apparatus for directing clean air to a patient zone comprising a movable air discharge head having outer walls defining an air passageway, delivery tube connected at one end to said head, a blower unit connected to the other end of said delivery tube for causing a pressurized air flow through said tube and the air passage of said head, said head having a terminal outlet and means for directing and discharging said air flow from said terminal outlet into a central column of relatively low velocity laminar flow air, high efficiency filter means within said head substantially adjacent said terminal outlet, said high efficiency filter means being in direct engagement with and supported by the outer walls of said head and occupying an area completely across said air passageway for cleaning said central column of air flow to be substantially contaminant free, nozzle means within said head immediately upstream of said filter means for channeling an outer peripheral portion of said air flow and accelerating the flow thereof to create an outer sheath of relatively high velocity air surrounding said central column, said nozzle means being effective to direct said air sheath through an outer peripheral portion of said high efficiency filter means so that said central column and outer sheath both are substantially contaminant free, and said head being selectively positionable to permit direction of said contaminant free air column onto a selected operating area.

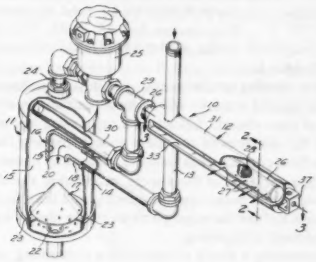
3,923,483

STEAM SEPARATOR

Milton Hilmer, Quakertown; John W. Ritter, Emmaus, and Niranjan Jiandani, Allentown, all of Pa., assignors to Sarco Company, Allentown, Pa.

Filed July 23, 1973, Ser. No. 381,878
Int. Cl.[2] B01D *45/08*
U.S. Cl. 55—463 **12 Claims**

1. A separator comprising housing means defining a chamber for separating water from wet supply steam, inlet conduit means connected to and in communication with said housing means for conducting wet supply steam to said housing means, said inlet conduit means having an outlet portion within said housing for controlling the inlet steam flow direction within the housing means, outlet conduit means connected to and in communication with said housing means for conducting dry steam from said housing means, separating means within said chamber, said separating means comprising a conical baffle having its axis in substantial alignment with the flow direction of the incoming steam and its apex pointing toward and in substantial axial alignment with said outlet portion, means defining a sealed re-evaporation chamber projecting through



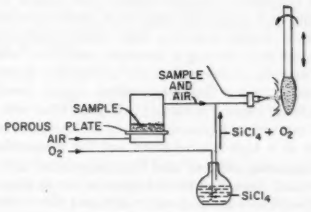
a wall of and into said housing means, and means providing fluid communication between said sealed chamber and said outlet conduit means operating to deliver water existing in said outlet conduit to said re-evaporation chamber and to return re-evaporated steam to said outlet conduit.

3,923,484

FLAME METHOD OF PRODUCING GLASS

Eric N. Randall, Bath, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,572
Int. Cl.[2] C03B *23/20, 25/00;* **C23C** *11/00*
U.S. Cl. 65—18 **4 Claims**



1. A method for making a transparent, homogeneous glass body consisting of at least two constituent oxides comprising the steps:

a. entraining within a gas stream vapors of a compound of SiO_2, GeO_2, B_2O_3, P_2O_5, SeO_2, and mixtures thereof that will hydrolyze in a flame to produce the corresponding glass forming oxides in particulate form;

b. entraining within a gas stream finely divided solid particles that do not exceed about one micron in size of a metal oxide additive, or a metal or metal compound convertible thereto by heat treatment in a flame; and

c. combining said gas stream containing the said vapors and said gas stream containing the said finely divided solid particles and then passing the combined gas stream into the flame of a combustion burner to form and codeposit a homogeneous oxide mixture as a glass body free from visual inclusions of inhomogeneities.

3,923,485
METHOD OF FABRICATING A FLUOROCARBON-FILLED MULTIPLE GLAZED WINDOW UNIT

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 28, 1973, Ser. No. 429,442

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C03B *23/24*

U.S. Cl. 65—24 **3 Claims**

1. In a method of fabricating a welded, fluorocarbon-filled multiple glazed window which involves the steps of cleaning a pair of glass sheets, depositing a separating agent on at least one of the surfaces of the glass sheets, placing the sheets in face-to-face contact such that the separating agent is between the facing surfaces of the sheets, preheating the sheets while in face-to-face contacting relationship and then finally heating the sheets to fuse the edge portions of the sheets together, the improvement comprising:

a. depositing a finely divided silica containing greater than about 98 percent by weight silica as the separating agent between the facing surfaces of the glass sheets; said silica being substantially free of chromium, titanium, tin, iron, vanadium and molybdenum.

3,923,486
METHOD OF PRODUCING LIGHT-CONDUCTING GLASS STRUCTURE

Ichiro Kitano, Kobe; Ken Koizumi, Itami, and Hiroyoshi Matsumura, Osaka, all of Japan, assignors to Nihon Itagarasu Kabushiki Kaisha, Japan

Division of Ser. No. 147,256, May 26, 1971, which is a continuation of Ser. No. 806,368, March 12, 1969, abandoned. This application Sept. 19, 1973, Ser. No. 398,832

Int. Cl.² C03C *15/00;* **G02B** *5/14*

U.S. Cl. 65—30 E **10 Claims**

1. A method for producing a glass fibrous structure for conducting light along the center axis thereof, characterized by having a refractive index distribution within said structure wherein a refractive index decreases continuously in a direction radially and outwardly from said center axis toward the outer surface of said structure, said method comprising: providing a glass fiber having a constant refractive index and a generally circular cross-section and containing therein a glass forming oxide and a first monovalent cation constituting a glass modifying oxide; contacting said glass fiber with a source of second monovalent cation all along the outer surface of the glass fiber at a high temperature and for a specific time to thereby cause migration of said first and second cations in the interior of said glass fiber at said temperature to thereby cause substitution of said second cation for said first cation in the glass of said glass fiber so as to decrease the refractive index of the glass fiber in a radially outward direction from said center axis; and controlling said specific time in such a manner that said second cation in said source migrates into said glass fiber through said outer surface of said glass fiber to thereby cause substitution of said second cation for said first cation so as to form concentration gradients of said first and second cations within the glass fiber, said gradients corresponding respectively to continuous increase and decrease of said first and second cations from said surface toward said center axis of said structure to thereby establish said refractive index distribution by said concentration gradients of said first and second cations.

9. A method for producing a glass fibrous structure for conducting light along the center axis thereof, characterized by having a refractive index distribution within said structure wherein the refractive index decreases continuously in a direction redially and outwardly from said center axis toward the outer surface of said structure, said method comprising: providing a glass fiber having a constant refractive index and a generally circular cross-section and containing therein a glass forming oxide and a first cation constituting a glass modifying oxide; contacting said glass fiber with a glass containing second cation all along the outer surface of the glass fiber at a high temperature and for a specific time to thereby cause migration of said first and second cations in the interior of said glass fiber at said temperature to thereby cause substitution of said second cation for said first cation contained in the glass of said glass fiber so as to decrease the refractive index of said glass fiber in a radially outward direction from said center axis, said contacting being carried out by fusing said glass onto the surface of said glass fiber; and controlling said specific time in such a manner that said second cation in said source migrates into said glass fiber through said outer surface of the glass fiber to thereby cause substitution of said second cation for said first cation so as to form concentration gradients of said first and second cations within the glass fiber, said gradients corresponding respectively to continuous increase and decrease of said first and second cations from said surface toward said center axis of said structure to thereby establish said refractive index distribution by said concentration gradients of said first and second cations.

3,923,487
METHOD OF MAKING GLASS AMPULS IN A NON-CONTAMINATING MANNER

Albert D. Lewis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 170,555, Aug. 10, 1971, Pat. No. 3,719,463. This application Nov. 13, 1972, Ser. No. 305,881

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C03B *23/12*

U.S. Cl. 65—110 **1 Claim**

1. A method of forming two ampuls which are hermetically sealed and vacuum released from a one-piece glass tube comprising the steps of:

heating a glass tube to a deformation temperature;

forming two ampul bodies by sealing the ends of said tube and drawing the center section of the tube to a degree to form a constricted portion thus forming a sealed ampul body at each end of the end portion of the tube length;

applying a small hydrogen oxygen flame about 0.005 inches in diameter to each ampul body to soften a portion of the glass, and then through the combined effort of the effect of the softened glass and a pressure difference within the ampuls due to a partial vacuum established during the forming process, forming a small hole in the glass ampul body thereby releasing the vacuum and equalizing the interior and exterior air pressure;

removing said flame thereby causing the formed hole to close immediately while the glass of the ampul body is still softened thus hermetically sealing the ampul; and

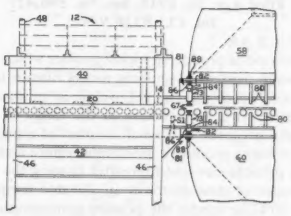
severing the common glass stem in the constricted section between the ampul bodies to form two sterile vacuum released ampuls from a one-piece glass tube.

3,923,488

METHOD OF TEMPERING FLAT GLASS SHEETS

Richard N. Pytel, Ford City; Fred H. Burdett, Worthington, and Steve M. Kozuch, Ford City, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1974, Ser. No. 464,405
Int. Cl.² C03B 27/00
U.S. Cl. 65—114 6 Claims



1. In the art of tempering a substantially horizontally disposed glass sheet which is conveyed in a substantially horizontal direction in direct sequential contact with successive conveyor elements spaced longitudinally of and extending transversely of the path of glass movement through a hot atmosphere where said glass sheet is heated to an elevated temperature sufficient for tempering and which is thereafter conveyed through a cooling station where said hot glass sheet is exposed to cooling medium applied toward the upper and lower major surfaces of said sheet in an amount and at a rate sufficient to impart at least a partial temper to said sheet and wherein said sheet has sufficient length to develop a convexly curved deviation from flatness in its leading edge portion, the improvement comprising applying a cooling medium to a portion of the major surface of the glass sheet adjacent to said leading edge portion wherein said convexly curved deviation from flatness occurs along a longitudinally extending portion thereof spaced from said leading edge of said glass sheet as said glass sheet moves from said hot atmosphere to said cooling station, said cooling medium being applied in an amount and at a rate sufficient to minimize said convexly curved deviation from flatness.

3,923,489

PELLETIZED FERTILIZER

Ralph W. Richardson, 195 Mount Lebanon Blvd., Pittsburg, Pa. 15228

Filed May 23, 1973, Ser. No. 363,126
Int. Cl.² C05D 9/00; C05C 3/00; C05F 11/00
U.S. Cl. 71—61 1 Claim

1. A method for making a pelletized nitrogen fertilizer where the nitrogen content of the final fertilizer product is regulated comprising:

a. thoroughly mixing dry ammonium sulphate with fly ash in the proportions of at least one part ammonium sulphate to three parts fly ash by weight whereby the nitrogen content is regulated by the amount of fly ash added to the ammonium sulphate while both are being dry mixed;
b. making a saturated solution of ammonium sulphate and water;
c. blending the mixture of dry ammonium sulphate and fly ash with the saturated solution of ammonium sulphate and water to form a wet doughy mass;
d. forming the said wet doughy mass into small individual particles by pelletizing the same; and
e. drying the individual particles to form a granulated fertilizer.

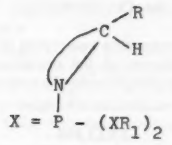
3,923,490

USE OF 1,2-DIHYDRO-PYRIDINE-N-PHOSPHONATES AND THIOPHOSPHONATES AS MICROBIOCIDES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 210,106, Dec. 20, 1971, Pat. No. 3,821,232. This application Mar. 19, 1974, Ser. No. 453,013
Int. Cl.² A01N 9/36
U.S. Cl. 71—67 11 Claims

1. A process for inhibiting bacteria, algae, fungi and protozoa in aqueous or petroleum hydrocarbon systems which comprises adding to said system a small but effective amount of a microbiocide which is a dihydro-nitrogen phosphonate of the formula



where $\overset{\frown}{N-C}$ represents a 1,2-dihydropyridine group, R and R_1 are lower alkyl or phenyl and X is O or S.

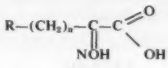
3,923,491

GROWTH REGULANTS FOR PLANTS

John B. O'Brien, Watertown, Conn., and Herman Stone, Andover, Mass., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,053
Int. Cl.² A01N 5/00
U.S. Cl. 71—76 6 Claims

1. A method for increasing the yield of leguminous and ornamental plants via height retardation which comprises applying to said plants an effective amount of a compound having the formula:



wherein *n* is an integer from 1–12 and R is selected from the group consisting of hydrogen, alkyl of 1–12 carbon atoms, cycloalkyl of 3–12 carbon atoms, alkenyl of 3–12 carbon atoms and alkynyl of 3–12 carbon atoms.

3,923,492

REGULATING PLANT GROWTH WITH 7-METHYLINDOLE

David John Collins, Ascot, and Edwin Francis George, Eversley, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 17, 1974, Ser. No. 480,271
Claims priority, application United Kingdom, June 29, 1973, 31024/73
Int. Cl.² A01N 9/22
U.S. Cl. 71—76 5 Claims

1. The method of regulating the growth of plants which comprises applying to the plants 7-methylindole in an amount sufficient to at least stunt the growth thereof.

3,923,493

HERBICIDE

Nikolai Nikolaevich Melnikov, ulitsa Dm. Ulyanova, 4, korpus A, kv. 96; Artur Felixovich Grapov, Davydkovskaya ulitsa, 10, kv. 106; Tamara Fedorovna Kozlova, Kolomensky proezd, 1, korpus 8, kv. 75, all of Moscow; Galina Borisovna Shakhova, Proletarskaya ulitsa, 8, kv. 20; Valery Pavlovich Pokatun, Tsentralnaya ulitsa 39/7, kv. 11, both of Schelkovo Moskovskoi oblasti; Leonid Dmitrievich Stonov, Lavrushensky pereulok, 17, kv. 21; Ljudmila Alexandrovna Bakumenko, ulitsa Gorkogo, 54, kv. 86, both of Moscow; Tatyana Akimovna Sergeeva, ulitsa Likhacheva 11, and Lidia Mikhailovna Titova, ulitsa Likhacheva 19, all of Dolgoprudny Moskovskoi oblasti, all of U.S.S.R.

Filed Jan. 6, 1972, Ser. No. 215,913
Int. Cl.[2] A01N 9/36

U.S. Cl. 71—87 2 Claims

1. A herbicidal composition comprising as an active ingredient an effective amount of the compound 0-(2-chloro-4-methylphenyl)-N-sec.-butylamido chloromethylthiophos

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3,923,494

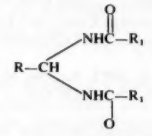
GEM-BIS AMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 24, 1973, Ser. No. 363,464
Int. Cl.[2] A01N 9/00

U.S. Cl. 71—88 7 Claims

1. An herbicide composition comprising a mixture of a herbicidally effective amount of a thiocarbamate herbicide and an antidote compound corresponding to the formula



in which R is substituted phenyl wherein said substituent is 3,4-methylenedioxy; and R_1 is lower chloroalkyl containing from 1 to 4 carbon atoms, inclusive; from about 0.01 to about 15 parts by weight of antidote compound for each part by weight of the thiocarbamate herbicide.

3,923,495

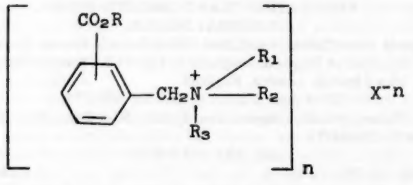
(CARBOXYBENZYL) TRIALKYL AMMONIUM SALTS AS PLANT GROWTH REGULANTS

Gerhard H. Alt, Creve Coeur, and Robert K. Howe, Bridgeton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 4, 1974, Ser. No. 529,415
Int. Cl.[2] A01N 9/20

U.S. Cl. 71—111 10 Claims

1. A method of regulating the growth of leguminous plants which comprises treating said leguminous plants with an effective amount of a compound of the formula



where R is a lower alkyl; R_1, R_2 and R_3 are independently lower alkyl, with the proviso that when R is propyl in the ortho position, R_1, R_2 and R_3 are not methyl; X^{-n} is an anion selected from the group consisting of Br^-, Cl^-, I^-, NO_3^-, SO_4^{-2} and CO_3^{-2}; and n is the numerical value of the valence state of the anion X^{-n}.

3,923,496

NICKEL POWDER AND A PROCESS FOR PRODUCING IT

David B. Pall, Forest Hills, N.Y., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 26, 1945, Ser. No. 590,427
Int. Cl.[2] B22F 9/00

U.S. Cl. 75—.5 AA 3 Claims

1. The method of producing nickel powder which comprises reacting oxalic acid with aqueous nickel nitrate to produce nickel oxalate, heating the nickel oxalate in an atmosphere of carbon dioxide at a temperature in the range of 450°C. to 850°C. in the presence of a small amount of a particle grain growth inhibitor to produce a substantially pure nickel powder of uniform particle size and thereafter heating the powder in a mildly oxidizing atmosphere at an elevated temperature of less than 100°C. to render the powder non-pyrophoric.

3,923,497

PROCESS FOR THE RECOVERY OF TANTALUM AND NIOBIUM AND OTHER METALS FROM TIN SLAG

John J. Scott, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 297,595, Oct. 16, 1972, Pat. No. 3,811,867. This application Mar. 21, 1974, Ser. No. 453,275The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.
Int. Cl.[2] C22B 51/00

U.S. Cl. 75—24 2 Claims

1. A process for the recovery of tantalum and niobium and other metals from commercial tin slag by the reduction of the oxides of said metals, by fusion of the tin slag in the presence of a reducing agent, wherein the improvement comprises:

adding to said tin slag a sufficient amount of a material selected from the group consisting of aluminum oxide, calcium oxide, silicon oxide-aluminum oxide, silicon oxide-calcium oxide, and aluminum oxide-calcium oxide to produce a molten bath having principally a $CaO.Al_2O_3.SiO_2$ phase that melts at a temperature 100° to 400° C. greater than the $CaO.Al_2O_3.SiO_2$ phase of said tin slag, said amount being determined by reference to a $CaO.Al_2O_3.SiO_2$ phase diagram; fusing the mixture of tin slag and additional aluminum oxide, calcium oxide, silicon oxide-aluminum oxide, silicon oxide-calcium oxide, or aluminum oxide-calcium oxide, in a tapping type arc furnace, periodically tapping off the tantalum-niobium depleted molten slag and replacing said tapped slag with a further addition of said mixture, repeating said slag tapping and mixture addition steps until a substantial amount of tantalum-niobium containing alloy has accumulated in the bottom of said furnace, and tapping said alloy from the bottom of the furnace.

3,923,498

PROCESS FOR THE REDUCTION OF TITANIFEROUS ORES

William Volk, Princeton, N.J., assignor to Hydrocarbon Research, Inc., Morristown, N.J.

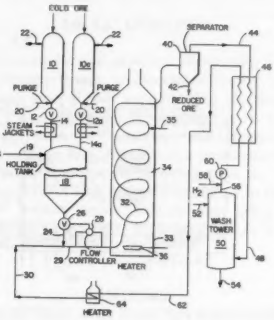
Continuation of Ser. No. 318,219, Dec. 26, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,328
Int. Cl.[2] C21B 13/00

U.S. Cl. 75—35 2 Claims

1. The method of fluidized direct reduction of the iron oxide in a particulate titaniferous ore without substantial reduction of titanium oxide using a hydrogen-rich reducing gas, wherein the ore is sized to all pass 20 mesh screen (U.S. Std.) with not

more than 25 percent passing 325 mesh screen and which consists essentially of:

a. pressurizing said ore and feeding it at a controlled rate upwardly through a vertical tubular heating zone together with a hydrogen-rich reducing gas at a temperature in the order of at least 1,000°F and at a pressure of at least 100 psig under conditions to establish a dilute phase loading of the ore in the range of three to 5 pounds per cubic foot gas entering the heating zone;



b. externally heating the gas-ore mixture in said heating zone to a temperature above 1350°F but not in excess of 1650°F; and

c. controlling the slip factor of the gas-ore mixture in the tubular heating zone in the order of at least 3 whereby a reduction in the range of 30 to 50 percent of the iron oxide is accomplished;

d. separating the reduced ore and gas effluent;

e. purifying the gas;

f. recycling the gas to the heating zone together with high purity make-up hydrogen; and

g. removing the reduced ore as product.

3,923,499

METHOD OF REMOVING SOLIDS (E.G. COPPER DROSS) FROM MOLTEN-LEAD BATHS

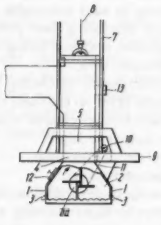
Peter Manthey, Krefeld-Bockum, and Hermann Matthies, Angermund, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 21, 1973, Ser. No. 399,511

Claims priority, application Germany, Sept. 29, 1972, 2247737

Int. Cl.² C22B *13/06*

U.S. Cl. 75—78 **2 Claims**



1. A process for removing a layer of substantially fine-grain solid material formed by refining and consisting of copper dross upon a bath of molten lead, comprising the steps of:

loosening said layer by mechanically disturbing it with a rotary beater extending into the copper dross on the surface of the bath and simultaneously sucking the loosened layer of solid material off from the bath directly upwardly in a gas stream by evacuation, and separating the solids from the gas stream in a filter device.

3,923,500

COPPER BASE ALLOY

Kunio Kitazawa, Takada, and Tatsuichi Fukusako, Tokyo, both of Japan, assignors to Toyo Valve Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 277,750, Aug. 3, 1972, abandoned. This application Sept. 4, 1974, Ser. No. 503,086

Claims priority, application Japan, Aug. 11, 1971, 46-60274; Mar. 1, 1972, 47-21375; Mar. 2, 1972, 47-21764; Mar. 3, 1972, 47-22001

Int. Cl.² C22C *9/01, 9/02*

U.S. Cl. 75—156.5 **8 Claims**

1. A high strength copper base alloy possessing excellent corrosion resistance and machinability, consisting essentially of 0.1 – 4 percent by weight Sn, 0.1–4 percent by weight Zn, 0.1–4 percent by weight Pb, and 5.0 to 10 percent by weight Al, the balance being essentially copper.

3,923,501

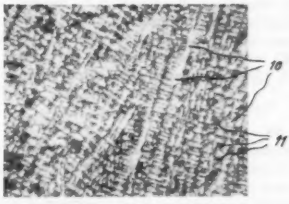
FILLER SOLDER

Carl R. Di Martini, Piscataway, and Michael Myers, New Brunswick, both of N.J., assignors to Asarco Incorporated, New York, N.Y.

Filed Jan. 9, 1974, Ser. No. 432,107

Int. Cl.² C22C *11/08, 11/10*

U.S. Cl. 75—166 C **6 Claims**



1. A filler solder containing essentially the following constituents in proportions within the proportion ranges hereafter set forth:

	% by Weight
Antimony	1.5 to 5.3
Arsenic	0.7 to 2.5
Tin	0 to 0.20
Lead	substantially the remainder

the total arsenic plus antimony being at least 3.5% but not more than 6%, the solder being substantially free of hard tin-arsenic platelets and free of an undesirable grittiness due to elimination of the hard tin-arsenic platelets, the solder having a freezing range corresponding to a liquidus of about 285°C. and a solidus of about 245°C., and a plasticity at an application temperature within the about 245°C. to about 285°C. freezing range such as to enable the solder plastic mass to be readily applied to an automobile body.

3,923,502

NEUTRON-ABSORBING ALLOY

Kim Isaevich Portnoi, ulitsa Vavilova, 48/4, kv. 395; Lidia Borisovna Arabei, 15 Parkovaya ulitsa, 42, korpus 5, kv. 57; Georgy Mikhailovich Gryazno, ulitsa Vernads kogo, 95, korpus 2, kv. 266; Lev Izrailevich Levi, B. Cherkizovskaya ulitsa, 5, korpus 1, kv. 112; Gleb Leonidovich Lunin, ulitsa Raspletina, 17, korpus 2, kv. 17; Valery Mikhailovich Kozhukhov, ulitsa Vlasova, 11, korpus 4, kv. 73; Jury Mikhailovich Markov, Khoroshevskoe shosse, 39, korpus 1, kv. 58, and Mikhail Egorovich Fedotov, Baikalskaya ulitsa, 15, kv. 203, all of Moscow, U.S.S.R.

Filed Jan. 16, 1974, Ser. No. 433,854
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 2 Claims

1. A neutron-absorbing alloy consisting essentially of the following ingredients in % by weight:
indium, between 1 and 20;
samarium, between 0.5 and 15;
hafnium, between 5 and 18;
nickel, the balance required to obtain 100.

3,923,503

ELECTROSTATIC LATENT IMAGE DEVELOPMENT EMPLOYING STEEL CARRIER PARTICLES

Robert J. Hagenbach, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 369,036, June 11, 1973, Pat. No. 3,849,182, which is a continuation-in-part of Ser. No. 834,862, June 19, 1969, abandoned. This application July 18, 1974, Ser. No. 489,631
Int. Cl. G03g *13/08*
U.S. Cl. 96—1 SD 9 Claims

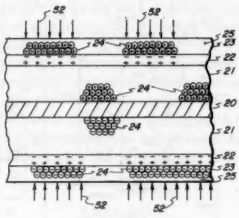
1. A method of forming a visible toner image comprising the steps of forming an electrostatic latent image on a recording surface and contacting said electrostatic latent image with a developer mixture until at least a portion of said toner particles are attracted to and held on said surface in conformance to said electrostatic latent image, said developer mixture comprising about one part by weight of finely-divided toner particles electrostatically adhering to the surface of about 10 parts to about 200 parts by weight of highly shape-classified low carbon hypereutectoid steel carrier particles having an average particle size between about 50 microns and about 1,000 microns and a specific gravity of at least about 7 grams per cubic centimeter, said steel carrier particles having been heat treated to a tempered martensitic microstructure with an average hardness of 40-55 Rockwell C in an air or oxygen atmosphere at temperatures ranging between about 500°F and about 1,000°F to provide an oxide surface layer comprising Fe_3O_4 on said steel carrier material, said oxide surface layer having a thickness between about 0.2 and about 5.0 microns, said steel carrier particles comprising carrier cores having a composition comprising about 95.0 to about 99.0 parts iron, about 0.1 to about 2.0 parts carbon, about 0.5 to about 2.0 parts manganese, about 0.5 to about 2.0 parts silicon, about 0.03 to about 0.1 parts aluminum, about 0.01 to about 0.05 parts phosphorus, and about 0.02 to about 0.05 parts sulphur, said treated carrier particles being overcoated with a resinous coating material capable of electrostatically releasing said electrostatically adhering toner particles to said electrostatic latent image.

3,923,504

MIGRATION IMAGING MEMBER AND METHOD

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 29, 1973, Ser. No. 327,363
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] G03G *5/00, 13/00*
U.S. Cl. 96—1.5 66 Claims



1. A method of preparing circuit components comprising;
a. providing a member comprising a softenable dielectric layer and a migration layer, said migration layer comprising electrically conductive migration material and substantially electrically insulating softenable material, said softenable dielectric layer and electrically insulating softenable material capable of becoming softened upon exposure to a softening agent, sufficiently to allow migration of migration material in depth in said softenable dielectric layer and electrically insulating softenable material; said migration layer residing on said softenable dielectric layer;
b. applying a migration force to said migration material by selectively creating a charge pattern without optical exposure in said migration layer in at least one circuit component configuration;
c. softening the softenable dielectric layer and electrically insulating softenable material at least sufficient to allow imagewise migration of at least one portion of electrically conductive migration material from said migration layer at least in depth into said softenable dielectric layer, with at least one portion of electrically conductive migration material remaining in said softenable migration layer, at least one of said migrating and remaining portions of conductive migration material being in said circuit component configuration; and,
d. removing the electrically insulating softenable material from the migration layer so that said remaining portion of electrically conductive migration material remains atop said softenable dielectric layer.

29. A circuit member, comprising:
a. a softenable dielectric layer;
b. electrically conductive migration material within said softenable dielectric layer forming at least one electrically conductive circuit component; and
c. a dielectric substrate upon which said softenable dielectric layer resides, said dielectric substrate being provided on its free surface with a discontinuous conductive coating comprising discrete portions, at least one of which discrete portions sandwiches the dielectric substrate between said at least one discrete portion and said at least one electrically conductive circuit component.

3,923,505
RECORDING MATERIAL HAVING AN ELECTROCONDUCTIVE LAYER COMPRISING THE REACTION PRODUCT OF EPIHALOHYDRIN WITH POLYETHYLENEMINE

Daniel Maurice Timmerman, Mortsel, and Walter Frans De Winter, Berchem, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed June 15, 1973, Ser. No. 370,327

Claims priority, application Germany, June 16, 1972, 028432

Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 **9 Claims**

1. An electroconductive substrate comprising a support of paper or synthetic polymer, an electroconductive layer coated on at least one side of said support, said electroconductive layer having a surface resistance measured at 15 % of relative humidity lower than 10^{11} ohm/sq., said electroconductive layer consisting of or including a major proportion of an aminoalkylated polyethyleneimine resulting from the reaction at 50°C of epihalohydrin with polyethyleneimine in the presence of an organic tertiary amine, said polymer being soluble in water and becoming insoluble by heating at 100°C.

3,923,506
PHOTOELECTRIC AND ELECTROPHOTOGRAPHIC PIGMENTS COMPRISING DERIVATIVES OF CONDENSED POLYCYCLIC AROMATIC HYDROCARBON ALDEHYDES

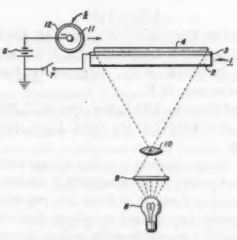
John Alf Bergfjord, Macedon; Steven James Grammatica, Webster, and Richard William Radler, Marion, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1973, Ser. No. 337,787

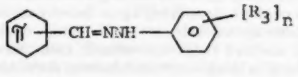
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G03G *13/14, 13/01, 5/04*

U.S. Cl. 96—1.5 **7 Claims**



1. An electrophoretic imaging suspension comprising a electrically insulating liquid carrier medium having dispersed therein an electrically photosensitive pigment composition comprising a mixture of pigments, at least a first of said pigments selected from the group consisting of cyan, magneta, or mixtures thereof, and another of said pigments comprising a pigment having the formula:



wherein:

represents a condensed polycyclic aromatic group having from about 14 to about 20 carbon atoms:

R_3 is selected from the group consisting of: H, OH, CH_3, OCH_3, C_2H_5, OC_2H_5, $COCH_3$, CO_2CH_3, COC_2H_5, $CO_2C_2H_5$, NO_2, CN, SO_2NH_2, $SO_2NHC_6H_5$, Cl, F, Br, I; and

n is a positive integer from 1–3.

3,923,507
SENSITIZED ELECTROPHOTOGRAPHIC LAYERS

Hans Ohlschlager, Cologne; Oskar Riester, Leverkusen, both of Germany; Theofiel Hubert Ghys, Kontich, Belgium; Karel Eugeen Verhille, Hoboken, Belgium, and Johannes Josephus Vanheertum, Halle-Zand-Hoven, Belgium, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Mar. 19, 1973, Ser. No. 342,886

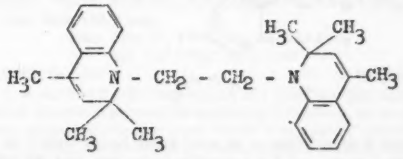
Claims priority, application Germany, Mar. 23, 1972, 2214054

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

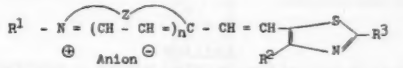
Int. Cl.² G03G *5/04, 5/06*

U.S. Cl. 96—1.6 **1 Claim**

1. An electrophotographic recording material having a layer support and at least one sensitized photoconductive layer containing a photoconductor and a sensitizing dye, wherein the improvement comprises embedded in a binder a photoconductor selected from the group consisting of zinc oxide, 1-ethyl-3-phenyl-7-diethylamino-2-(1H)-quinoline, the photoconductor compound of the following formula:

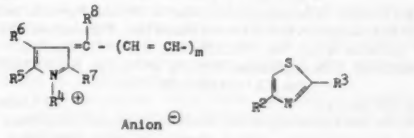


and in the photoconductor a sensitizing dye compound of one of the following formulae:



I

and



II

in which

R^1 is a saturated or unsaturated aliphatic group having up to six carbon atoms and which may be substituted, a cyclohexyl or a phenyl group;

R^2, R^4 and R^8 is a hydrogen atom or a saturated or unsaturated aliphatic group having up to six carbon atoms or a phenyl group;

R^3 is an —SR^9 or $NR^{10}R^{11}$ group;

R^5, R^6 is a hydrogen atom a saturated or unsaturated aliphatic group having up to three carbon atoms, or R^5 and R^6 together represent the ring members required to complete a condensed benzene or naphthalene ring;

R^7 is a hydrogen atom, a saturated or unsaturated aliphatic group having up to three carbon atoms or a phenyl group; R^9, R^{10} and R^{11} is a saturated or unsaturated aliphatic group containing up to six carbon atoms; or R and R together denote a radical required to complete a heterocyclic ring selected from the group consisting of pyrrolidone, piperidine, morpholine, thiomorpholine, indoline and tetrahydroquinoline rings;

n is 0 or 1;

m is 0 or 1;

Anion $^-$ is an anion selected from the group consisting of a halide, perchlorate, sulfate, methyl sulfate, p-toluene-sulfonate, acetate and oxalate, this being absent in cases where R^1, R^4 or R^6 contains an acid group in the anionic form so that a betaine is present;

Z is a radical required to complete a heterocyclic group comprising a 5- or 6-membered heterocyclic ring of the type used in cyanine dyes.

3,923,508

DYED POLYVINYL CARBAZOLE PHOTOCONDUCTIVE LAYER

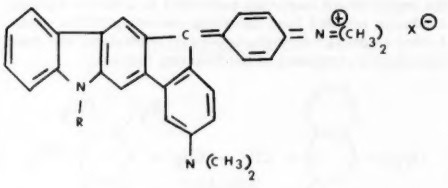
Karel Kriz, Marlboro, Mass.; Susan B. Gorman, Barrington, and John J. Krajewski, Wheeling, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 10, 1974, Ser. No. 432,254

Int. Cl.[2] G03G *5/09*

U.S. Cl. 96—1.6 **8 Claims**

1. A photoconductive layer sensitive to visible light comprising polyvinyl carbazole and a dye having the structure:



where R is hydrogen or an alkyl group having from 1 to 10 carbon atoms, and X is a negative counterion, said dye being present in said polyvinyl carbazole in a proportion of from about 1×10^{-6} to about 1×10^{-4} mole of dye per gram of polyvinyl carbazole.

3,923,509

WATER-SOLUBLE POLYESTER RESINS AS BINDERS FOR PHOTOCONDUCTORS

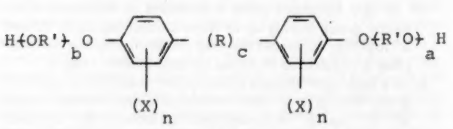
Erich Kuehn, Wilmington, and John R. Wyhof, Newark, both of Del., assignors to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 362,539, May 21, 1973, Pat. No. 3,865,869. This application Oct. 10, 1974, Ser. No. 513,887

Int. Cl.[2] G03G *5/06, 5/08*

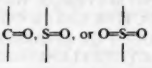
U.S. Cl. 96—1.8 **12 Claims**

1. An electrophotographic recording element comprising a base support having coated thereon a layer comprising a photoconductive material and an amine salt of a polyester resin said resin comprising the reaction product of a dicarboxylic acid or an anhydride thereof, provided that at least 80 mol percent of said acid or anhydride is an alpha unsaturated dicarboxylic acid, an anhydride thereof, an aromatic dicarboxylic acid or an anhydride thereof, and a polyol blend comprising a first polyol having the following formula:



wherein

R is an alkylidene group containing from 1 to 4 carbon atoms, a cycloalkylidene group containing 5 or 6 carbon atoms, oxygen, sulfur, or a radical having one of the following formulas:



c is 0 or 1;

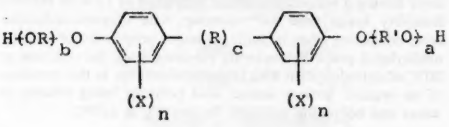
X is halogen or an alkyl radical containing from 1 to 3 carbon atoms;

n is an integer equal to from 0 to 4;

R′ is an alkylene group containing from 2 to 4 carbon atoms or the radical $CH_2CH\phi$; and

a and *b* are integers each of which is equal to at least 1 and the sum of which is equal to about 2, provided that the sum must be equal to at least 2.0;

and a second polyol having the following general formula:



wherein

R, c, X, R′, and n are as defined above and a and b are integers each of which is equal to at least 1 and the sum of which is equal to from about 9 to about 16; wherein the amount of acid or anhydride employed is sufficient to introduce from about 0.8 to about 1.2 carboxyl groups per hydroxyl group in the polyol blend and the amine has a boiling point of less than about 100°C.

2. An electrophotographic recording element, as claimed in claim **1**, wherein the photoconductive material is zinc oxide.

3,923,510

PROCESS FOR PRODUCING COLOR IMAGES BY BLEACHING REDOX DIFFUSIBLE DYE RELEASERS

Jon T. Staples, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,390

Int. Cl.[2] G03C *7/16, 7/00, 5/54, 5/32*

U.S. Cl. 96—20 **20 Claims**

1. A process for producing a color image comprising:

I. imagewise exposing a photosensitive element comprising a support having thereon at least one photosensitive silver halide emulsion layer, said emulsion layer having associated therewith a nondiffusible redox dye releaser which will redox with oxidized developing agent to release a diffusible, bleachable dye, said redox dye releaser being a ballasted, bleachable dye wherein the ballast group is linked to the dye through a linkage which is cleavable upon oxidation;

II. treating said photosensitive element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers, thereby oxidizing said developing agent and forming a metallic silver image;

a. said oxidized developing agent thereby crossoxidizing said redox dye releaser;

b. said oxidized redox dye releaser then cleaving, thus forming an imagewise distribution of diffusible, bleachable dye which diffuses out of said element;

III. bleaching said element to decolorize any imagewise-released dye which has not diffused out of said element; and

IV. removing said metallic silver and silver halide from said element by bleaching and fixing;

whereby a dye image is obtained in said element which is the reverse of said metallic silver image.

3,923,511

PHOTOGRAPHIC PROCESS AND COMPOSITION EMPLOYING CO(III) COMPLEXES AND SILVER HALIDE SOLVENTS

Vernon Leon Bissonette, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 189,289, Oct. 14, 1971, abandoned, and a continuation-in-part of Ser. No. 312,168, Dec. 4, 1972, abandoned. This application Oct. 1, 1973, Ser. No. 402,432

Int. Cl.[2] G03C 7/16, 7/00, 5/32, 5/38

U.S. Cl. 96—22 23 Claims

4. A photographic monobath process wherein a photographic element comprising a support having thereon an imagewise-exposed photosensitive silver halide is contacted with an alkaline processing solution in the presence of a reducing agent for said metal salt to form a first image comprising silver and forming a second photographic image in the areas of said first image, and said silver image and said photosensitive silver halide are bleached and fixed with the combination of a cobalt(III) complex with a solvent for said photosensitive silver halide, said alkaline processing solution containing said solvent for said photosensitive silver halide, and said cobalt(III) complex being present in said alkaline processing solution or said photographic element, said solvent for said photosensitive silver halide and said cobalt(III) complex bleaching and fixing said silver image and said photosensitive silver halide after formation of said second photographic image.

23. In a photographic film unit comprising:

a. a photosensitive element comprising a support having thereon at least one photosensitive silver halide emulsion layer, each said silver halide emulsion layer having associated therewith a dye image-providing material;

b. a rupturable container containing an alkaline processing composition; and

c. a silver halide developing agent;

the improvement wherein said film unit contains a cobalt(III) complex and a silver halide solvent capable of bleaching and fixing said element.

3,923,512

IMAGE RECORDING PROCESS

John S. Berkes, Webster; William J. Hillegas, Fairport, and Samuel W. Ing, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 129,184, March 29, 1971, abandoned. This application Aug. 23, 1972, Ser. No. 283,124

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03G 13/00

U.S. Cl. 96—27 R 13 Claims

1. A method of imaging which comprises exposing an amorphous layer of arsenic trisulfide to a pattern of light having wavelengths less than the bandgap radiation of said arsenic trisulfide, whereby the optical density of the amorphous layer is increased in the areas exposed to the light to form a visible image and heating the imaged layer to a temperature above that at which the image was formed to erase the image.

3,923,513

DIRECT POSITIVE PROCESSING OF SILVER HALIDE WITH METAL DOPANTS IN DIFFUSION TRANSFER FILMS

Francis John Evans, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 324,611, Jan. 18, 1973, abandoned, which is a division of Ser. No. 123,005, March 10, 1971, Pat. No. 3,761,276. This application Aug. 9, 1974, Ser. No. 496,433

Int. Cl.[2] G03C 7/00, 5/54, 5/24, 1/40

U.S. Cl. 96—29 D 23 Claims

1. In an image-transfer film unit which comprises an image-receiving layer, at least one layer of a photo-sensitive composition having associated therewith an image dye-providing material, a developing agent, and a processing composition which can be discharged to facilitate development of said photosensitive composition by passing said unit between a pair of juxtaposed pressure-applying members, the improvement comprising (1) said photosensitive composition in said film unit comprising unfogged silver halide grains having metal dopants occluded therein, which grains have been chemically sensitized on the surface thereof (a) to a level which will provide a density of less than 0.4 when developed in Kodak Developer DK-50 for 5 minutes at 27°C after imagewise exposure when said photosensitive composition is coated at a coverage of between about 300 to about 400 mg of silver per square foot and (b) to at least a level which would provide a density of 0.5 using undoped silver halide grains of the same grain size and halide composition when coated, exposed and developed in like manner, and (2) a fogging agent located in said film unit whereby it will be in contact with said photosensitive composition upon discharge of said processing composition.

3,923,514

METHOD FOR THE PREPARATION OF RELIEF PRINTING MASTERS

Dana G. Marsh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 27, 1974, Ser. No. 483,869

Int. Cl.[2] G03C 5/00, 1/68

U.S. Cl. 96—35 10 Claims

1. A method for the preparation of a relief printing master which comprises exposing to activating radiation in an imagewise manner a printing plate which comprises a substrate having on its surface a film of a composition consisting essentially of

a. a degradable polymer containing units of the formula:

wherein R_1 is hydrogen or methyl and R_2 is hydrogen, an alkyl radical of 1 to 6 carbon atoms, a chlorinated or fluorinated aliphatic radical of 1 to 6 carbon atoms or a cyano substituted radical of 1 to 5 carbon atoms provided that when R_1 is methyl, R_2 is also methyl, and

b. a photo-oxidant which upon activation is capable of abstracting an electron from one or more of the oxygen atoms in said polymer.

3,923,515

X-RAY FILM WITH REDUCED PRINT-THROUGH

Albert L. van Stappen, Rumson, N.J., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 24, 1974, Ser. No. 482,570

Int. Cl. G03c 1/92, 1/46

U.S. Cl. 96—45.1 10 Claims

1. An improved X-ray film comprising a support bearing on both sides a layer of a low speed, fine grain silver halide emulsion overcoated with a layer of a high speed silver halide emulsion, the high speed emulsion having a photographic speed from 2 to 10 times that of said low speed emulsion, and said low speed emulsion having a silver halide grain size of from 0.1 to 1.4 micron.

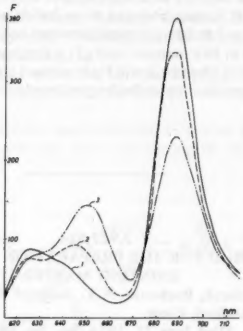
3,923,516
RECORDING INFORMATION BY MEANS OF A PHOTOSENSITIVE MATERIAL OF BIOLOGICAL ORIGIN

Esther Dujardin, Avenue des Bois 8, B 4050, Mery-Esneux; Ysbrand Kuiper, Grammerode 21, B 3800, St. Truiden; René Cremer, Avenue des Tilleuls 2, B 4000, Liege, and Cyrille Sironval, Avenue des Bois 8, B 4050, Mery-Esneux, all of Belgium

Filed Jan. 24, 1973, Ser. No. 326,185. The portion of the term of this patent subsequent to Mar. 18, 1992 has been disclaimed.

Int. Cl. G03c *1/00, 5/24*

U.S. Cl. 96—48 R **5 Claims**



1. Photorecording material comprising a support coated with a photographic sensitive layer consisting essentially of a photographically active product formed by:

extracting from an etiolated plant material a photoactive protochlorophyll(ide)-apoprotein binary complex with a buffer solution at a pH between 7 and 10 in the presence of an agent to protect the apoprotein against denaturation at a temperature of at most 5°C;

adding to said binary complex at a temperature of at most 5°C a natural or synthetic polymeric material selected from the group consisting or polyethylene glycol, polyvinylpyrrolidone, triethanolamine, saccharose and dextran to form a precipitate;

cold-centrifuging said precipitate to form a product which is either in complex or in association with said polymeric material; and

lyophylizing said product at a temperature of at most 5°C so that the dried final product remains photoactive at room temperature, said product forming a pattern by information-wise exposure to light of information-wise differentiations in light-absorption and fluorescence emission characteristics.

3,923,517
METHOD FOR RAPIDLY FORMING PHOTOGRAPHIC IMAGES

Nobuo Yamamoto; Ikutaro Horie; Kiyotaka Hori; Shigeru Nagatomo; Hidefumi Sera, and Kenji Yokoo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 14, 1974, Ser. No. 442,556

Claims priority, application Japan, Feb. 15, 1973, 48-18624

Int. Cl.² G03C *5/26, 5/24, 1/72*

U.S. Cl. 96—50 R **19 Claims**

1. A method for rapidly forming photographic images, which comprises first image-wise exposing and then development of a photographic light-sensitive material which includes a support having thereon at least one silver halide emulsion layer and an uppermost layer containing a gelatin derivative, at a temperature of at least 30°C, said gelatin derivative being the reaction product of gelatin with a monofunctional compound selected from an isocyanate, an aziridine and a sulfonyl halide, and said gelatin derivative being present in an amount of not less than 20% by weight based on the total weight of said uppermost layer.

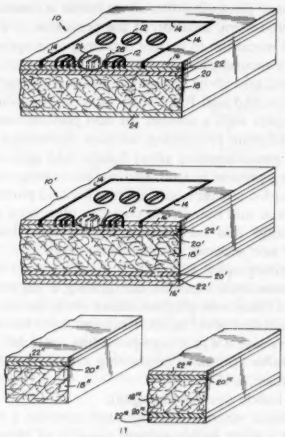
3,923,518
ERASABLE DIAZOTYPE MATERIAL WITH VINYL CHLORIDE AND METHYL ACRYLATE COPOLYMER INTERLAYER

Peter Muller, Port Washington, N.Y., assignor to Andrews Paper & Chemical Co., Port Washington, N.Y.

Filed Apr. 10, 1973, Ser. No. 349,727

Int. Cl.² G03C *1/76, 1/80, 1/86*

U.S. Cl. 96—75 **6 Claims**



1. An erasable diazotype reproduction material comprising: a base sheet having applied thereto at least three layers coated on at least one side of said base sheet with at least one of said layers forming an interlayer containing an externally plasticized vinyl chloride-methyl acrylate copolymer wherein from 70% to 90% of the copolymer is polyvinyl chloride and the balance is made up of methyl acrylate radicals, at least one of said layers containing diazo sensitized components which comprises a photosensitive diazonium salt, an acid stabilizer and a diazo-coupler and at least one of said layers being a precoat layer positioned between said diazo components containing layer and said interlayer; whereby the diazo reproduction is easily erased by mechanical means without destroying the surface of the base sheet.

3,923,519
U.V. LIGHT ABSORBERS IN SUPPORTS OF INTEGRAL DIFFUSION TRANSFER FILM UNITS

Ronald F. Ciecluch, Boston, and Herbert N. Schlein, Beverly, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

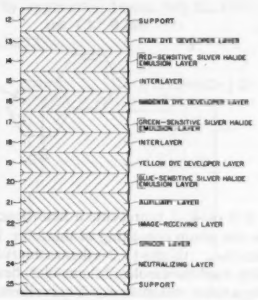
Continuation-in-part of Ser. No. 214,600, Jan. 3, 1972. This application Oct. 24, 1972, Ser. No. 300,277

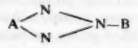
Int. Cl.² G03C *1/40, 1/48, 1/84*

U.S. Cl. 96—77 **34 Claims**

1. In a photographic comprising a diffusion transfer photosensitive system, a diffusion transfer image receiving system and a reflecting system and wherein said systems are integrated so that the product is adapted for forming a visible image by diffusion transfer of image providing material from said photosensitive system to said image receiving system which image is viewable by reflection and without separation of said receiving system and said photosensitive system, said image receiving system including an image receiving layer and a dimensionally stable layer through which said image is viewable and through which said photosensitive system is exposed;

the improvement which comprises including in said dimensionally stable transparent layer an ultraviolet absorber, said ultraviolet absorber being substantially transparent to visible light and wherein said ultraviolet absorber provides an optical density of at least about 1 at substantially all of the wavelengths at least between the region of about 300 to about 375 mμ and wherein said ultraviolet absorber is a 2-aryl-4,5 arylo-1,2,3 triazole of the formula





where

A represents a phenylene radical bounded by two neighboring carbon atoms to two nitrogen atoms of the triazole ring and,

B represents a 2-hydroxyphenyl radical which can be substituted by groups not imparting strong coloration.

3,923,520

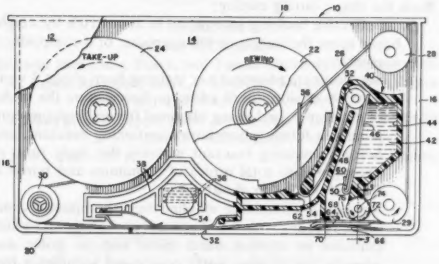
FILM STRIP CASSETTE WITH MOVING PROCESSING FLUID DOCTORING SURFACE

Edward F. Burke, Jr., Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 26, 1974, Ser. No. 492,054

Int. Cl.[2] G03C *3/02, 11/00;* **G03B** *23/02;* **G03D** *5/00*

U.S. Cl. 96—78 **10 Claims**



1. In a cassette containing an elongated photographic film strip having a light sensitive emulsion on one surface thereof and also containing a processor operative to apply a processing fluid coating of predetermined thickness to substantially the entire length of said film emulsion after exposure thereof, the improvement comprising:

means responsive to an external actuator for progressively advancing said film strip within said cassette;

means for treating progressive incremental sections of said emulsion surface of said film strip with a quantity of said processing fluid having an initial thickness substantially greater than said predetermined thickness of said coating as said film strip is advanced therepast by said film strip advancing means; and

means responsive to an external actuator for establishing a moving doctoring surface operative against said initial thickness of said processing fluid applied to said film strip by said fluid treating means to reduce said initial thickness of said processing fluid and spread said processing fluid uniformly across the width of said emulsion surface, said doctoring surface when operative moving in a direction opposite to the direction of advancement of said film strip past said fluid treating means and being spaced from said emulsion surface of portions of said film strip emerging from said fluid treating means a distance substantially less than said initial thickness of processing fluid and greater than said predetermined thickness of processing fluid coating.

3,923,521

ULTRAVIOLET HOLDBACK OF NONSILVER PHOTOSENSITIVE SYSTEMS BY INCORPORATING THEREIN CERTAIN ORGANIC ADDITIVES

Andrew C. Hazy, Mentor; John E. Shirey, Bedford, and Lothar Ramins, Middlefield, all of Ohio, assignors to Horizons Incorporated a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Jan. 31, 1973, Ser. No. 328,495

Int. Cl.[2] G03C *1/52*

U.S. Cl. 96—90 R **8 Claims**

1. In a non-silver photosensitive composition comprising:

1. at least one N-vinyl amine compound which forms a color when exposed to a dose of suitable radiation in the presence of an activator;

2. at least one such activator for said color forming N-vinyl amine compound, said activator being selected from the group consisting of (a) organic halogen compounds represented by the general formula Q—C—X_3 wherein Q represents a monovalent radical selected from the group consisting of Cl, Br, I, H, alkyl, aryl, aroyl and arylalkyl, and each X is a halogen atom selected from the group consisting of Cl, Br and I; (b) sulfur containing organic compounds represented by the formula RSH or RSSR in which each R represents an aryl or heterocyclic ring; and (c) sulfonyl and sulfenyl halides;

the improvement of which consists in the incorporation in said composition of

3. at least one organic compound which produces imagery having improved ultraviolet holdback said compound being selected from the group consisting of indole, quinoline, acridine, acridan, phenoxazine, quinazoline, phenazine, 2-phenylindole, 1-amino-4-hydroxy-9,10-anthraquinone, 1-amino-4-benzamido-9,10-anthraquinone, 1,4-diamino-9,10-anthraquinone, 1-amino-5-benzamido-9,10-anthraquinone, 1-5-dibenzamido-9,10-anthraquinone, 1,4-diamino-2,3-dichloro-9,10-anthraquinone and 2-amino-1,4-naphthoquinone, phenylene diamines and phenylacetates.

3,923,522

PHOTOSENSITIVE COMPOSITION

Yukinori Hata, Tokyo; Hidetoshi Komiya, Chiba; Yuzuru Osabe, Yokohama; Tutomu Watanabe, Tokyo, and Hiroyoshi Yamada, Musashino, all of Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

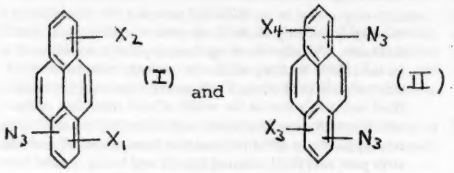
Filed July 18, 1973, Ser. No. 380,276

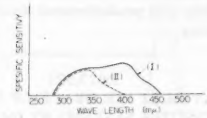
Int. Cl. G03f *7/08;* **G03c** *1/72*

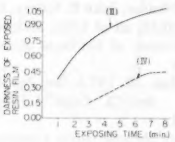
U.S. Cl. 96—115 R **23 Claims**

1. A photosensitive composition capable of being photohardened and insolubilized in alkaline aqueous solutions upon photographic exposure, said composition comprising an alkalisoluble phenolic resin and 5 to 30%, based on the weight of said phenolic resin, of at least one photosensitive compound selected from the group consisting of monoazidopyrene

compounds of the formula (I) and diazidopyrene compounds of the formula (II):







wherein X_1, X_2, X_3 and X_4 each represents a hydrogen or halogen atom or nitro, monoalkylamino, acylalkylamino, dialkylamino, tosylamino, alkoxyl, hydroxyl, acyl, carboxyl, carboxymethyl or sulfonic acid radical.

3,923,523

PHOTOCURABLE COMPOSITION AND A METHOD OF PREPARING SAME

Tadatomi Nishikubo; Masahiko Kishida, and Masakazu Imaura, all of Fujisawa, Japan, assignors to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Sept. 26, 1973, Ser. No. 400,814

Claims priority, application Japan, Sept. 29, 1972, 47-97203

Int. Cl.² G03C *1/68, 1/70*

U.S. Cl. 96—115 P **5 Claims**

1. A photocurable composition comprising: (a) the polyester obtained from pyromellitic acid dianhydride and a polyol selected from the group consisting of a reaction product of polyethylene glycol diglycidyl ether and acrylic acid (molar ratio 1:2), a reaction product of polypropylene glycol diglycidyl ether and acrylic acid (molar ratio 1:2), a reaction product of neopentyl glycol diglycidyl ether and acrylic acid (molar ratio 1:2), a reaction product of bisphenol-A diglycidyl ether and acrylic acid (molar ratio 1:2) and the corresponding methacrylate or crotonate derivatives, and (b) a photopolymerization initiator.

3,923,524

FOGGED DIRECT POSITIVE SILVER HALIDE EMULSIONS CONTAINING PHOTOGRAPHIC SENSITIZING DYES DERIVED FROM SUBSTITUTED SALICYLALDEHYDES

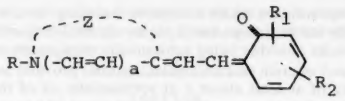
Jan Raymond Haase, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,948

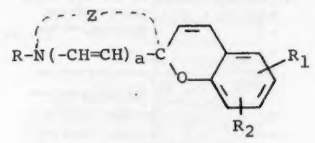
Int. Cl.² G03C *1/22*

U.S. Cl. 96—140 **12 Claims**

1. A fogged direct positive photographic silver halide emulsion containing at least one photographic silver halide sensitizing dye selected from those having the formulas:



and



wherein a is 0 or 1; Z represents a heterocyclic nucleus selected from the group consisting of thiazoles, benzothiazoles, naphthothiazoles, thieno-[1,2-a]benzothiazoles, oxazoles, benzoxazoles, naphthoxazoles, selenazoles, benzoselenazoles, naphthoselenazoles, thiazolines, 2-quinolines, 4-quinolines, 3,3-dialkylindolenines, 2-pyridines, 4-pyridines, imidazoles, benzimidazoles, naphthimidazoles, and lepidines; R represents a lower alkyl group or an aryl group; and R_1 and R_2 each represents hydrogen, a nitro group, a halo group, a lower alkoxy group or a lower alkyl group, provided that at least one of the groups R_1 and R_2 is a nitro group or a halo group.

3,923,525

FOUNDRY COMPOSITIONS

Richard H. Toeniskoetter, Worthington, and John J. Spiwak, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 17, 1973, Ser. No. 351,903

Int. Cl.² B28B *7/34*

U.S. Cl. 106—38.3 **24 Claims**

1. Composition for the fabrication of foundry shapes having a porosity sufficient to permit escape from the shape of at least most of the volatiles formed during casting which comprises:
a. a major amount of foundry aggregate in sufficient quantity and having particle size large enough to provide sufficient porosity in the foundry shape to permit escape of volatiles from the shape during casting;
B. an effective bonding amount up to about 10% by weight based upon the weight of the aggregate of a composition comprising:
1. an aluminum phosphate containing from about 3 mole % to about 40 mole % of boron based upon the moles of aluminum, and being obtained from aluminum-containing reactant, phosphorus-containing reactant, and boron-containing reactant wherein the mole ratio of phosphorus to total moles of aluminum and boron is from about 2:1 to about 4:1;
2. an oxygen-containing alkaline earth compound capable of reacting with the aluminum phosphate and which contains an alkaline earth metal and an oxide; and wherein the alkaline earth compound includes a free alkaline earth metal oxide and/or free alkaline earth metal hydroxide, and wherein the free alkaline earth metal oxide and/or free alkaline earth metal hydroxide has a surface area of no greater than about 8.5 m^2/gram; and
3. water;
C. and wherein the amount of said aluminum phosphate is from about 60 to about 95% by weight based upon the total weight of (1) and (2), the amount of said alkaline earth material is from about 5 to about 40% by weight based upon the total weight of (1) and (2); and the

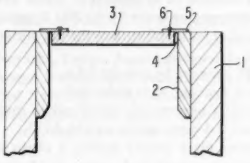
amount of said water is from about 15 to about 50% by weight based upon the total weight of (1) and (3).

3,923,526

HEAT-INSULATING BOARD FOR COVERING THE TOP SURFACE OF A FEEDER HEAD

Masaru Takashima, Tokyo, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1973, Ser. No. 321,425
Claims priority, application Japan, July 22, 1972, 47-73538
Int. Cl.[2] B28B *7/36*
U.S. Cl. 106—38.22 3 Claims



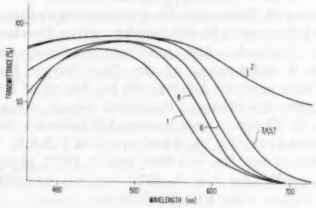
1. A heat-insulating board for covering the top surface of a feeder head which comprises a plate-like molding and a composition attached to the outer rim of the plate-like molding; said composition comprising 5–80% by weight of a chemically treated heat-expandable material of flake-like graphite or pitch treated with an acid and/or an oxidizing agent, 0–92% by weight of a refractory material, 0–30% by weight of an easily oxidizable metal, 0–30% by weight of an oxidizing agent, 0–40% by weight of a non-metallic fibrous material, 0–20% by weight of a carbonaceous substance, 0–10% by weight of an oxidation accelerating agent and 3–20% by weight of a binder; said plate-like molding comprising 20–94% by weight of a refractory material selected from the group of silica sand, quartz, magnesia (magnesium oxide), alumina (aluminum oxide), olivine, aluminum ash, dolomite, magnesite, limestone, chamotte, corundum, diatomaceous earth, lapilli, expanded vermiculite, expanded shale, expanded obsidina, expanded perlite and expanded pitch-stone, 3–40% by weight of a fibrous material, 0–30% by weight of an easily oxidizable metal, 0–30% by weight of an oxidizing agent, 0–20% by weight of a carbonaceous substrate, 0–10% by weight of an oxidation accelerating agent and 3–20% by weight of a binder; the heat-insulating board being adapted to expand upon being heated.

3,923,527

COLORED GLASS

Takashi Matsuura, Fussa, and Fumio Chihara, Akishima, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Filed Mar. 4, 1974, Ser. No. 447,793
Claims priority, application Japan, Aug. 17, 1973, 48-92179
Int. Cl.[2] C03C *3/00*
U.S. Cl. 106—47 R 4 Claims



1. A colored glass consisting of parent glass compositions consisting essentially of by weight, 75 to 88 % of P_2O_5, 6 to 15 % of Li_2O, 3 to 14 % of Al_2O_3, 0 to 5 % of Na_2O, 0 to 5 % of K_2O, 0 to 5 % of ZrO_2, 0 to 5 % of TiO_2, 0 to 5 % of La_2O_3, 0 to 5 % of MgO and 0 to 5 % of ZnO, and 0.5 to 10 parts of CuO per 100 parts of said parent glass compositions wherein said glass exhibits suppression of absorption of rays having a wavelength of 400 nm or less.

3,923,528

GLASS-CERAMIC ARTICLES

Makoto Kume, Itami, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Mar. 22, 1974, Ser. No. 453,996
Claims priority, application Japan, Mar. 22, 1973, 48-33300
Int. Cl.[2] C03C *3/04, 3/08*
U.S. Cl. 106—52 4 Claims

1. A glass-ceramic article consisting essentially of, on a weight percent basis, 54–68% SiO_2, 5–13% Al_2O_3, 0–11% MgO, 8–28% CaO, the sum of the proportions of MgO and CaO being 18–28%, 2–8% B_2O_3, 0.1–2.5% ZnO, 0.05–0.3% sulfide sulfur, and 3–10% R_2O, R_2O being a combination of at least two of Li_2O, Na_2O, and K_2O, the mol ratio of Li_2O/R_2O being 0.05–0.4, the mol ratio of Na_2O/R_2O being 0–0.4, and the mol ratio of K_2O/R_2O being 0.5–0.95, the total of these components being at least 95% by weight, said composition being devoid of fluorine therein.

3,923,529

SODALITE-RELATED GLASS COMPOSITIONS FOR PRODUCTION OF PHOTOCHROMIC AND FLUORESCENT ARTICLES

Roger J. Araujo, Corning; George H. Beall, Big Flats, and Loris G. Sawchuk, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 10, 1975, Ser. No. 540,169
Int. Cl.[2] C03C *3/04, 3/08, 3/12, 3/22*
U.S. Cl. 106—52 4 Claims

1. A glass composition useful for the production of photochromic glass and glass-ceramic articles which consists essentially of, in weight percent as calculated from the batch, about 17–34% total of alkali metal oxides, essentially including Na_2O, selected in the indicated proportion from the group consisting of 12–33% Na_2O, 0–20% K_2O, and 0–7% Cs_2O; 17–33% total of modifying oxides selected from the group consisting of Al_2O_3 and Ga_2O_3; 22–54% total of network-forming oxides selected in amounts not exceeding the indicated proportions from the group consisting of up to 41% SiO_2 and up to 54% GeO_2; 2.5–30% total of halogen selected in amounts not exceeding the indicated proportions from the group consisting of up to 9% F and up to 30% Cl; and 1–10% total of constituents selected from the group consisting of SO_3, SeO_2 and Te.

3,923,530

DIELECTRIC GLASS COMPOSITION

Thomas A. Sherk, West Hurley, and Rao R. Tummala, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1973, Ser. No. 374,189
Int. Cl.[2] C03C *3/10, 3/04, 3/30*
U.S. Cl. 106—53 7 Claims

1. A dielectric glass having a thermal coefficient of expansion (from room temperature to 300°C) in the range of approximately 81.6–86.0 × 10^{-7} per °C and a crazing temperature with respect to a magnesium oxide overcoat in the range of approximately 455° – 505°C, consisting essentially of the following ingredients in the following proportions:

hc,22 Percent by weight

Lead oxide	(PbO)	62.4 – 69.6
Boric oxide	(B_2O_3)	13.6 – 20.0
Silicon oxide	(SiO_2)	5.8 – 13.6
Alumina	(Al_2O_3)	0.2 – 1.0
Calcium oxide	(CaO)	0.0 – 6.0
Magnesium	(MgO)	0.0 – 5.0

and wherein the total amount of CaO plus MgO is 3.0 – 8.4 percent by weight.

3,923,531

CARBON COMPOSITION AND SHAPED ARTICLE MADE THEREFROM

Joseph R. Parsons, Park Forest, and Harold L. Rechter, Chicago, both of Ill., assignors to Chicago Fire Brick Company, Chicago, Ill.

Filed July 5, 1974, Ser. No. 485,964The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.

Int. Cl.² C04B *7/02, 35/02, 35/52*

U.S. Cl. 106—56 **6 Claims**

1. A composition suitable for making shaped refractory articles consisting essentially of particles of carbon in from 20–80 per cent by weight, a hydraulic cement in from 5–30 per cent by weight, particles of a refractory oxide or silicate in 0–65 per cent by weight, silicon metal in at least 5 per cent by weight, and pitch from 0–20 per cent by weight.

3,923,532

ZINC LIGNOSULFONATE STABILIZING BINDER SOLUTION FOR MAGNESIUM OXIDE REFRACTORY FORMING MIXTURES AND METHOD

Frank C. Morman, Wausau, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 21, 1974, Ser. No. 516,437

Int. Cl.² C04B *35/04, 35/12*

U.S. Cl. 106—59 **12 Claims**

1. A refractory forming mixture suitable for pressure forming into refractory shapes, consisting essentially of:

a. about 90% to about 98% by weight particulate refractory material containing magnesium oxide; and

b. about 2% to about 10% by weight of densifying binder solution intermixed with said particulate refractory material, said binder solution consisting essentially of a solution of zinc lignosulfonate and water, said zinc lignosulfonate being present in an amount sufficient to stabilize the refractory forming mixture for up to about 3 hours at aging temperatures above 35°C to prevent substantial loss of density of refractory shapes pressed from the refractory forming mixture, the water being from about 1% and not exceeding about 5% by weight of the refractory material.

4. The refractory forming mixture as specified in claim 3 wherein said binder solution contains at least about 1.0% zinc on the weight of said lignosulfonate salt.

6. The refractory forming mixture as specified in claim 5 wherein said binder solution contains at least about 1.0% zinc on the weight of said lignosulfonate salt.

3,923,533

THERMALLY STABLE AND CRUSH RESISTANT MICROPOROUS GLASS CATALYST SUPPORTS

Joseph J. Hammel, and Ties Allersma, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 311,191, Dec. 1, 1972, Pat. No. 3,843,341, which is a continuation-in-part of Ser. No. 231,346, March 2, 1972, abandoned, and a continuation-in-part of Ser. No. 264,081, June 19, 1972, abandoned. This application Mar. 1, 1974, Ser. No. 447,199

Int. Cl.² C03C *3/06, 3/30, 3/08*

U.S. Cl. 106—54 **13 Claims**

1. A strong, thermally stable, microporous glass article having a pore volume of at least 0.35 cubic centimeters per gram, pore sizes ranging from 50 to 200 Angstrom units, and a surface area of at least 100 square meters per gram, comprising:

a. at least 96 percent by weight SiO_2,

b. less than 4 percent by weight B_2O_3,

c. less than 0.05 percent by weight alkali metal oxide, and

d. less than 0.4 percent by weight Al_2O_3;

said microporous glass article having a crush strength of at least 20 pounds per square inch gauge, and losing less than 30 percent of its original surface area and undergoing less than 25 percent volume shrinkage when the article is subjected to a temperature of 980°C. for 24 hours.

3,923,534

COLD-SETTING REFRACTORY COMPOSITIONS

John Edward Cassidy, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 14, 1973, Ser. No. 360,186

Claims priority, application United Kingdom, May 22, 1972, 23885/72; Jan. 22, 1973, 3174/73

Int. Cl.² C04B *35/66*

U.S. Cl. 106—62 **11 Claims**

1. A cold-setting refractory composition comprising water, refractory filler, a water-soluble complex aluminum phosphate binding agent containing aluminum and phosphate in a molar ratio of Al:P of substantially 1:1 and the anion of a carboxylic acid or of a mineral acid other than an oxyphosphorus acid and, as setting agent, magnesia of low reactivity, the ratio of magnesia to complex aluminum phosphate binding agent in the composition being in the range 1:200 to 1:1 by weight and the binding agent being present in a proportion of 1 to 25% by weight of the refractory filler.

3,923,535

HEAT INSULATING MATERIAL

Leonid Borisovich Zilberman, Ekonomicheskaya ulitsa, 1a, kv. 12; Semen Borisovich Krakhmalnikov, ulitsa Korolenko, 18, kv. 17; Gennady Alexandrovich Kudinov, prospekt Gagarina, 8 mikroraion, 32, kv. 203; Dorina Borisovna Kutsykovich, prospekt Lenina, 39, kv. 54, all of Kharkov; Jury Gavrilovich Moiseev, Donetskoi oblasti, ulitsa Ilicha, 138, kv. 5, Zhdanov, and Abram Mikhailovich Shneider, ulitsa Artema, 17, kv. 16, Kharkov, all of U.S.S.R.

Continuation of Ser. No. 269,805, July 7, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,908

Int. Cl.² C04B *35/68*

U.S. Cl. 106—84 **2 Claims**

1. A heat insulating material comprising powdery and liquid components in % by weight: the powdery component being a filler having the following composition

river sand	17–19% by weight
asbestos	8–10% by weight
ferrochrome slag	2–3% by weight

with chamotte powder making up the balance; the liquid component being a binding agent comprising liquid glass, 9–10%, in addition to 100% of the powdery components, a solvent comprising water 19–21%, in addition to 100% of the powdery components, and a foaming agent of the surface-active substance type, 0.5–1.0% in addition to 100% of the liquid components.

3,923,536

METHOD AND APPARATUS FOR BURNING RAW MATERIALS OF CEMENT CLINKER

Toshihiro Kobayashi, Tokyo, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1973, Ser. No. 416,960
Claims priority, application Japan, July 3, 1973, 48-74451
Int. Cl.[2] C04B *7/44*
U.S. Cl. 106—100 **1 Claim**

1. In a method for burning raw materials of cement clinker of the type comprising preheating and calcining raw materials by a suspension preheater provided with a calcining device having a burner, burning raw materials which pass through said preheater to form cement clinker in a rotary kiln, and cooling said cement clinker by a clinker cooler from which the heated air obtained by the cooling of clinker is directly induced to said device and used as its combustion air together with the exhaust gas from said rotary kiln; the improvement which comprises mixing said heated air with said exhaust gas which contains dust, and condensing volatile matters contained in said exhaust gas as gaseous phase thereby adhering said condensed volatile matters to said dust; separating said dust from the mixture of said combustion air and said exhaust gas; supplying said mixture after dust separation to said calcining device, thereby utilizing said mixture for the combustion of said calcining burners; and discharging at least a portion of said separated dust and volatile matters to which said dust is adhered.

3,923,537

COLD ASPHALT BINDER AND PAVING PROCESS

Jack E. Wood, Upland, Calif., assignor to Bray Oil Company, Los Angeles, Calif.

Filed Apr. 28, 1972, Ser. No. 248,580
Int. Cl.[2] C08L *95/00;* **C09D** *3/24*
U.S. Cl. 106—277 **3 Claims**

1. A stable liquid composition suitable for binding stone aggregate comprising (A) a suspension in water of powdered hard asphalt, softening point above about 250°F., having a particle size lying predominantly in the range of 10 to 200 mesh stabilized with a water soluble dispersant and (B) a flux oil of the character used in paving mixtures, the ratio of asphalt to flux oil in the composition being about 1:4 to 1:10.

3,923,538

PRIMROSE CHROME YELLOW PIGMENT AND PROCESS FOR ITS PREPARATION

Julius Jackson, Westfield, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 18, 1973, Ser. No. 324,879
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C09C *3/00*
U.S. Cl. 106—298 **4 Claims**

1. A process for the production of a primrose yellow shade pigment consisting essentially of 0.5 to 10 weight percent of one or more hydrous oxides selected from the group consisting of alumina, titania and zirconia, and 90 to 99.5 weight percent of an orthrhombic phase lead chromate-lead sulfate solid solution consisting essentially of 40 to 85 weight percent of lead chromate and 15 to 60 weight percent of lead sulfate, said solid solution containing no more than about 0.35 weight percent of CO_2, calculated as $PbCO_3$ by:

a. admixing a first aqueous solution containing a soluble lead salt and having a pH of 3.8 to 4.2 with a second aqueous solution having a pH of 6.5 to 7 and containing chromate and sulfate ions, the admixing being conducted in the presence of a combination of acetic acid, Al^{+3} ions, and $P_2O_7^{-4}$ ions to precipitate the solid solution as a stable orthorhombic crystal phase, the composition of the two solutions being selected to produce the solid solution composition in the form of a slurry having a pH of 1.4 to 2,

b. adjusting the pH of the aqueous slurry thus formed to 4 to 6 and maintaining it at an elevated temperature of 40° to 80°C. for at least 5 minutes,

c. thereafter surface-coating the precipitate with 0.5 to 10 percent, based on the final pigment weight of at least one hydrous oxide selected from the group consisting of alumina, titania and zirconia to further enhance light-fastness, and

d. filtering the surface-coated precipitate, washing it free of residual ions, drying it and then heating the pigment for a minimum of 15 minutes to a temperature of at least 110°C. to maximize lightfastness.

2. A chrome yellow pigment of the primrose type having excellent color intensity and improved thermal stability characteristics, said pigment consisting essentially of 0.5 to 10 weight percent of one or more hydrous oxides, selected from the group consisting of alumina, titania and zirconia, and 90 to 95.5 weight percent of an orthorhombic phase lead chromate-lead sulfate solid solution consisting essentially of 40 to 85 weight percent of lead chromate and 15 to 60 weight percent of lead sulfate, said solid solution containing no more than about 0.35 weight percent of CO_2, calculated as $PbCO_3$.

3,923,539

METHOD CONCENTRATE AND SOLUTION FOR SIMULTANEOUS CLEANING, DEGREASING AND REMOVAL OF THE LUBRICANT CARRIER LAYER FROM IRON AND STEEL WORKPIECES

Peter Jorns, Frankfurt am Main, Germany, assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 13, 1973, Ser. No. 332,055
Claims priority, application Germany, Feb. 19, 1972, 2207848
Int. Cl. C23g *1/16;* **C11d** *7/16;* **C23g** *1/20*
U.S. Cl. 134—2 **4 Claims**

1. A method for the simultaneous cleaning, degreasing and removal of a cold-forming lubricant carrier layer from workpieces containing iron comprising contacting said workpiece with an aqueous alkaline solution comprising 5–80 g/l phosphate ion and at least 0.05 g/l of a metal ion selected from the group consisting of cobalt, nickel and mixtures thereof, and having a pH adjusted to a value between 8 and 13 for at least one minute.

3,923,540

METHOD FOR TREATMENT OF METALLIC SURFACE

Shoji Usami, Sayama, and Haruo Kozu, Fujisawa, both of Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed Feb. 19, 1974, Ser. No. 443,487
Claims priority, application Japan, Mar. 1, 1973, 48-23749The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.
Int. Cl.[2] C23G *1/00*
U.S. Cl. 134—2 **8 Claims**

1. A method for treating a metallic surface which comprises aerobically contacting the metallic surface with a cultured suspension of ferrobacillus micro-organism, in which said ferrobacillus is at least one member of ferrobacillus ferrooxidans and ferrobacillus sulfooxidans, at a temperature of 20°–45° C.

6. A method of cleaning the surface of a metallic article at least partially coated with objectionable foreign material comprising the steps of:

a. providing an immersion bath comprising a cultured suspension of a ferrobacillus micro-organism;

b. immersing the article to be cleaned into said bath maintained at 20°–45°C under aerobic conditions for a time sufficient to effect release of said objectionable material from the surface of said metallic article;

c. withdrawing said metal article from said bath: and

d. rinsing said metal article with a fluid to thereby remove the released objectionable material and suspension from the surface thereof to provide a clean surface.

3,923,541
VAPOR DEGREASING SYSTEM

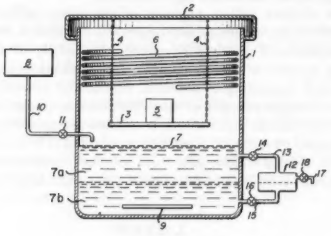
Robert Michael Healy, Warrenville, Ill., assignor to Litton Systems, Inc., Chicago, Ill.

Filed June 20, 1973, Ser. No. 371,836

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B08B *3/10, 5/00*

U.S. Cl. 134—31 **1 Claim**



1. The method of cleaning an article contaminated with organic acid materials so as to form a biodegradable waste comprising the steps of:

inserting the article to be cleaned of organic acid residues into the vapor section of a vapor degreaser, said vapor degreaser having a two-phase liquid solvent located in the sump thereof, said two-phase liquid solvent comprising a first liquid containing an organic solvent and a second liquid containing water and an inorganic base of low volatility, said inorganic base being sufficiently strong to neutralize said organic acid materials, and said first and second liquids being immiscible in one another;

heating said mixture to boil said two-phase liquid solvent wherein said solvent is in a state of turbulance and a vapor of water and organic solvent is created in said vapor section and refluxing said mixture, without vaporizing said inorganic base.

3,923,542
ELECTROLYTE FOR GALVANIC CELLS WITH HYDROGEN STORAGE ELECTRODES

Klaus von Benda, Kemnat, and Wolfgang Lohnert, Waiblingen, both of Germany, assignors to Firma Deutsche Automobilgesellschaft mbH, Germany

Filed June 27, 1973, Ser. No. 373,911

Claims priority, application Germany, June 27, 1972, 2231348

Int. Cl.² H01M *10/00*

U.S. Cl. 136—6 GC **6 Claims**

1. An electrolytic in combination with a galvanic cell employing a hydrogen storage electrode, said electrolyte being alkaline and containing, besides alkali metal ions, additional ions of at least one oxy salt of a metal selected from the group consisting of aluminum, zinc, tin, vanadium, molybdenum, tungsten, beryllium, and gallium, the deposition potential of the metal contained in the electrolyte as an oxy salt being at least 50 millivolts more negative than the reversible hydrogen potential in the same electrolyte.

3,923,543
ELECTROCHEMICAL CELL

James J. Auborn, Groton, and Sheldon I. Lieberman, Burlington, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 305,796, Nov. 13, 1972, abandoned. This application Oct. 24, 1974, Ser. No. 517,557

Int. Cl. H01m *35/00*

U.S. Cl. 136—6 LN **24 Claims**

1. An electrochemical cell comprising an alkali metal anode; a catalytic cathode material including at least in part an intercalation compound of graphite and fluorine represented by the general formula $(C_4F)_n$ wherein n refers to the presence of an indeterminately large number of recurring (C_4F) groups in the intercalation compound; and an electrolyte consisting essentially of an inorganic solvent material selected from the group consisting of phosphorus oxychloride, monofluorophosphoryl dichloride, thionyl chloride, sulfuryl chloride and mixtures thereof, and a solute dissolved in said inorganic solvent material, said solute including a Lewis acid or a material yielding a Lewis acid by dissociation in said inorganic solvent material; said cell being characterized by having a coulombic cathode utilization of at least about 142% of the theoretical which would be attained by reduction of the cathode material to elemental carbon and fluoride ions.

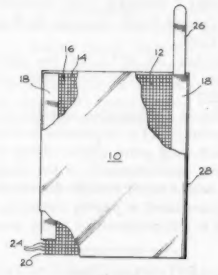
3,923,544
ZINC ELECTRODE AND METHOD OF MAKING SAME

Aldo S. Berchielli, Westerly, R.I., assignor to Electrochem, Inc., New York, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,876

Int. Cl. H01m *35/00*

U.S. Cl. 136—30 **12 Claims**



1. An improved zinc electrode for electrolytic cells, said electrode comprising, in combination:

a. a porous metal grid;

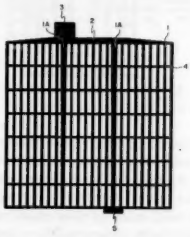
b. at least one solid strip of zinc metal disposed on said grid along an edge thereof; and

c. a zinc oxide-containing shape-retaining particulate mixture including a binder and covering at least one side of said grid and overlying said strip, the portion of said mixture overlying said strip having a substantially higher density than the remainder of said mixture.

3,923,545
GRID STRUCTURE FOR HIGH RATE LEAD/ACID BATTERY

Robert S. Margulies, Redondo Beach, Calif., and Royce E. Biddick, Edina, Minn., assignors to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.

Filed Mar. 30, 1973, Ser. No. 346,613
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] H01M *4/73*
U.S. Cl. 136—36 6 Claims



1. A rectangular battery grid structure comprising:

A. at least one current-collector tab on one edge of the grid structure;

B. a plurality of parallel current-carrying elements, wherein said element on one edge of said grid structure is tapered widest at the middle of said element and said tab is positioned at said thickest width;

C. a plurality of parallel current-carrying elements joined at right angle to said elements in (B) wherein at least two of which are equispaced and are tapered from one side of the grid structure to the opposite side of the grid structure with the broadest width joining said tab-carrying side element in the widest section wherein the number and size of said current-carrying elements are governed by a mathematical equation:

$$fm = I[E-I(R_g+R_p+R_e)]/W$$

wherein I is plate current, E is half-cell potential of the plate, R_g is grid resistance, R_e is electrolyte resistance, and R_p is pellet resistance, and W is weight of plate to give a figure of merit, *fm*.

4. A rectangular pasted plate for a storage battery comprising:

A. a plurality of rectangular pellets held in a grid pattern formed by

B. a plurality of parallel current-carrying elements, wherein said element on one side of said grid pattern is tapered widest at the middle of said element;

C. a plurality of parallel current-carrying elements joined at right angle with said elements in (B) wherein at least two of the elements are equispaced across the grid pattern and are tapered from one side of the grid structure to the opposite side of the grid structure with the broadest width joining said tapered element in (B) at the widest section; and

D. a current-collector tab on said tapered element of (B) at the intersection of one of said tapered elements of (C) wherein the number and size of said current-carrying elements are governed by a mathematical equation:

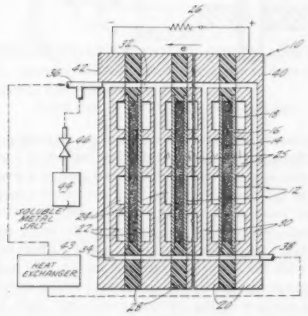
$$fm = I[E-I(R_g+R_p+R_e)]/W$$

wherein I is plate current, E is half-cell potential of the plate, R_g is grid resistance, R_e is electrolyte resistance, R_p is pellet resistance, and W is weight of plate to give a figure of merit, fm.

3,923,546
CORROSION PROTECTION FOR A FUEL CELL COOLANT SYSTEM

Murray Katz, Newington; Stanley W. Smith, Talcottville, both of Conn., and David Reitsma, Monroeville, Pa., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1974, Ser. No. 532,556
Int. Cl.[2] H01M *8/04*
U.S. Cl. 136—86 R 26 Claims



1. The combination of:

a fuel cell stack having a positive end and a negative end and comprising a plurality of cells connected electrically in series, said stack including components defining coolant channels for carrying a coolant fluid into heat exchange relationship with said cells and a coolant manifold passage extending from the positive to the negative end of said stack for distributing a coolant fluid to said channels, said components comprising an oxidizable material and being in electrical communication with said fuel cells and connecting them in series electrically; and

an ionically conductive coolant fluid within said manifold passage providing a path for shunt current from the positive to the negative end of said stack, said fluid including a soluble salt of a metal mixed therein wherein the metal of said salt is in solution at the positive end of said stack as an ion which oxidizes at the positive end of said stack at an electrochemical potential below which said materials of said components at the positive end of said stack are oxidized for the level of shunt current through said fluid.

3,923,547
BATTERY OF PRIMARY CELLS

Hubertus Ludovicus Cornelius Nuijens, Tessenderlo, Belgium; Robert Theodorus Maria Doedee, and Adrianus Cornelis Josephus Maria Snethorst, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1974, Ser. No. 470,275
Claims priority, application Netherlands, May 15, 1973, 736715
Int. Cl.[2] H01M *1/02*
U.S. Cl. 136—107 3 Claims

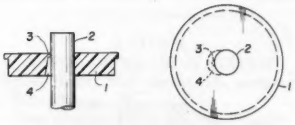
1. A battery comprising at least one primary cell consisting of a single cell or series of parallel-arranged cells whose metal electrode is also the cell wall in an envelope, characterized in that the space between the cell wall and the envelope comprises at least one material capable of binding possible released electrolyte by increasing the viscosity of the electrolyte.

3,923,548

ELASTIC GAS VALVE FOR GALVANIC CELLS

Glaister Steward Bell, and Jakob Bauer, both of Ellwangen, Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed May 18, 1973, Ser. No. 361,462
Claims priority, application Germany, May 24, 1972, 2225140
Int. Cl.[2] H01M 2/12
U.S. Cl. 133—133 9 Claims



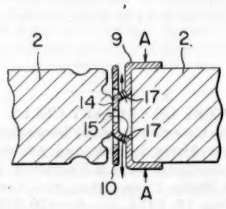
1. In a galvanic cell having a cover and a current conductor extending through the cover, said cover including a gas valve, said cover and said gas valve being fabricated as a single piece with the gas valve an integral part of the cover comprising a sealing disc located at the cell cover and surrounding the current conductor with only a portion of the inner peripheral surface of said sealing disc surrounding said current conductor in contact with the surface of said conductor, said sealing disc having an inner rim gas-tightly in contact with a smooth vertical surface portion of the current conductor, said inner rim constituting only a portion of the inner peripheral surface of said sealing disc surrounding said current conductor, at least one part of said inner rim in contact with said smooth surface portion of the current conductor being elastically yieldable under the action of a given increased gas pressure within the cell so as to vent the gas.

3,923,549

BATTERY CONNECTION DEVICE

Kenichi Mabuchi, Tokyo, and Toshihisa Tsuchimochi, Ichikawa, both of Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Oct. 24, 1974, Ser. No. 517,528
Claims priority, application Japan, Oct. 29, 1973, 48-125181[U]
Int. Cl.[2] H01M 13/10, 1/04
U.S. Cl. 136—134 P 3 Claims



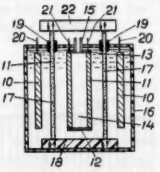
1. In a battery source cassette having a plurality of cells, the improvement comprising a cup-shaped, electrically conductive cell-connecting cap having a central projecting portion provided with apertures therein and a skirt portion, said central projecting portion being welded to an electrode portion of a first cell and said skirt portion being welded to an electrode portion of a second cell adjacent to said first cell.

3,923,550

METHOD AND APPARATUS FOR AVOIDING DENDRITE FORMATION WHEN CHARGING ACCUMULATOR BATTERIES

Otto von Krusenstierna, Vasteras, Sweden, assignor to AGA Aktiebolaget, Lidingo, Sweden

Continuation of Ser. No. 186,219, Oct. 4, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,591
Claims priority, application Sweden, Oct. 9, 1970, 13696/70
Int. Cl.[2] H01M 47/00
U.S. Cl. 136—165 12 Claims



1. Method of reducing dendrite formation when repeatedly charging an accumulator battery containing cells with a zinc anode part and a cathode, and an ion-permeable separator part arranged in a liquid electrolyte between the anode part and the cathode, with each of said anode and separator parts having a large generally planar surface defining the plane of said part and a comparatively small thickness in a direction perpendicular to said plane, which comprises vibirating one of the parts in each cell in the direction of the plane of the parts with a frequency of between about 1 and 500 Hz and an amplitude of between about 0.1 and 10 mm during the charging process, whereby said vibration inhibits dendrite formation on said zinc anode part.

3,923,551

METHOD OF MAKING A THERMOPILE WITH INSULATINGLY SEPARATE JUNCTIONS ON AN ALUMINA INSULATOR

David L. Purdy, Indiana, Pa., assignor to Arco Medical Products Company, Leechburg, Pa.

Division of Ser. No. 817,271, April 14, 1969, Pat. No. 3,649,367, which is a continuation of Ser. No. 554,874, June 2, 1966, abandoned. This application Dec. 7, 1971, Ser. No. 205,591
Int. Cl. H01v 1/04
U.S. Cl. 136—201 1 Claim

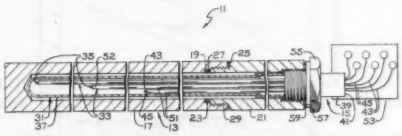
1. The method of forming a thermopile formed of hundreds of thermoelectric conductors, the said thermopile including an alumina insulator having thereon an electrical junction including a plurality of sets of said thermoelectric conductors, each set forming thermocouples of said thermopile having terminal ends at said junction, the said method including the steps of depositing on spaced regions of said insulator a first layer of titanium which adheres to said insulator, the deposit on each region being insulated from the deposit on other regions, depositing on said first layer a second layer of copper, depositing on said second layer a third layer of silver, said second and third metals when heated to a eutectic temperature forming a eutectic which wets said first metal but does not wet said insulator, disposing said terminal ends of said sets on said layers, and heating said layers to said temperature to form a junction of said first layer, said eutectic and said terminal ends, said junctions being insulated from each other.

3,923,552

HERMETICALLY SEALED THERMOCOUPLE ASSEMBLY

Joseph N. Parris, Irwin, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 21, 1972, Ser. No. 317,347
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] H01V *1/02*
U.S. Cl. 136—234 14 Claims



1. A thermocouple assembly, comprising:
an outer sheath, comprising: a metal case having an open end and a closed end;
an inner support ledge adjacent the open end of said metal case;
a pressure deformable metal washer positioned on said inner support ledge of said metal case, said washer having a coefficient of expansion greater than said metal case;
a metal tube having a first end and a second end, the first end being insertable in the open end of said metal case against said metal washer, said metal tube having a coefficient of expansion at least the same as the metal case but less than said metal washer; and
means for securing the first end of said metal tube in the open end of said metal case with the first end of said tube against said washer to prevent the first end of said metal tube and of said metal case from separating when said outer sheath is heated to expand at least said metal washer to form a hermetic seal at the union of said case and said tube capable of withstanding high pressures;
a thermocouple probe mounted in said sheath; and
means for forming a hermetic seal between said thermocouple probe and the second end of said metal tube to contain an atmosphere within said outer sheath.

3,923,553

METHOD OF MANUFACTURING LATERAL OR FIELD-FFECT TRANSISTORS

Yutaka Hayashi, Hoya, and Yasuo Tarui, Tokyo, both of Japan, assignors to Kogyo Gijutsuin, Japan

Division of Ser. No. 268,004, June 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 62,838, Aug. 11, 1970, abandoned. This application Dec. 7, 1973, Ser. No. 422,881
Claims priority, application Japan, Oct. 14, 1969, 44-81743; Nov. 20, 1969, 44-92511; Nov. 20, 1969, 44-92512
Int. Cl.[2] H01L *21/00, 7/44*
U.S. Cl. 148—1.5 6 Claims

6. A method of manufacturing a lateral transistor having a semiconductor substrate with a collector region and an emitter region of the same conductivity type formed therein and a base region of an opposite conductivity type as said emitter and collector regions and disposed therebetween, comprising the steps of:
providing a semiconductor substrate having a first layer of a first conductivity type and an adjacent underlying second layer of a second conductivity type opposite said first conductivity type;
forming on said first layer a mask layer having a window therethrough surrounding a portion of said mask layer to expose an area of said first layer defined by said window;
selectively implanting and diffusing an impurity of said second conductivity type through said window and into said first layer to a sufficient depth to impart said second conductivity type to a region of said first layer extending to said second layer to define an emitter region comprised of a region of said first layer isolated from the remainder of said first layer by said region having said second conductivity type imparted thereto; and
subsequently selectively diffusing an impurity of said first conductivity type through said window to impart said first conductivity type to a portion of said region having said second conductivity type imparted thereto to form a collector region of said first conductivity type, the remainder of said region having said second conductivity type imparted thereto defining a base region of said second conductivity type disposed between said emitter region and said collector region of said first conductivity type.

3,923,554

PHOSPHATE COATING COMPOSITION AND METHOD

Victor F. Ziemba, Detroit, Mich., assignor to Detrex Chemical Industries, Inc., Detroit, Mich.

Filed Feb. 7, 1974, Ser. No. 440,593
Int. Cl.[2] C23F *7/08*
U.S. Cl. 148—6.15 Z 2 Claims

1. A method of preventing inhibition of effective coating action of an aqueous zinc phosphate coating bath on ferrous metal surfaces due to the presence of nitrite ions in such coating bath, said method comprising:
a. providing an aqueous zinc phosphate coating bath,
b. adding sodium nitrite to said zinc phosphate coating bath, thereby forming nitrite ions, and
c. adding to said bath a compound selected from the group consisting of urea and urea nitrate in an amount in the range from about 0.1 grams per liter to about 10 grams per liter of the total solution.

3,923,555

PROCESSING COPPER BASE ALLOYS

Stanley Shapiro, New Haven, and Ronald N. Caron, Branford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 4, 1974, Ser. No. 512,259
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—11.5 A 10 Claims

1. A process which comprises:
A. providing a copper base alloy consisting essentially of from 1.0 to 4.5% silicon, from 1.0 to 5.0% tin, balance copper, wherein the total silicon plus tin content is at least 3.5%;
B. hot rolling said alloy at a starting temperature in excess of 650°C and within 50°C of the solidus temperature of the alloy, and with a finishing temperature in excess of 400°C;
C. cold rolling the alloy at a temperature below 200°C; and
D. annealing the alloy at a temperature of from 250° to 850°C for from 10 seconds to 24 hours.

3,923,556

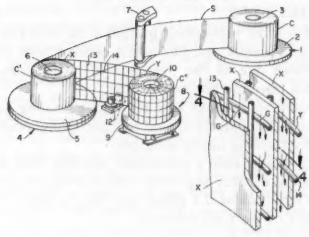
FORMATION OF OPEN COIL WITH SPACER BAND

Ludwig C. Iszczukiewicz, Maple Heights, Ohio, assignor to Lee Wilson Engineering Company, Inc., Cleveland, Ohio

Filed Dec. 3, 1973, Ser. No. 420,917
Int. Cl.[2] C21D *1/74, 9/68*
U.S. Cl. 148—16 6 Claims

1. In the process of heat treating metal strip in an open coil which comprises coiling metal strip into an open coil in which the convolutions of the strip in said coil are spaced to permit passage of treating gas therebetween, said strip being of such small thickness and of such substantial width relatively to said thickness that when said treating gas is passed between said convolutions of said open coil adjacent convolutions of said strip in said coil can bend, distort, or change form sufficiently to cause said convolutions to contact sufficiently to impair

substantially the uniformity of treatment by said gas and the quality of the treated strip unless said adjacent convolutions are kept separated over a major portion of the width of said strip and thereafter during such heat treatment passing a treating gas between said spaced convolutions of said strip, the improvement which comprises winding the strip into a coil simultaneously with a longitudinal spacer so that the spacer is located between adjacent convolutions of the strip, the spacer comprising a band that is at least as wide as a major portion of the width of said strip, that longitudinally of said band is sufficiently flexible to be wound between the convolutions of said strip in said coil and transversely thereof is sufficiently wide and stiff to restrict the convolutions of the coil separated by said spacer band from bending transversely thereof substantially throughout at least a major portion of the width of the strip, said spacer band being formed of spaced substantially parallel elongated members extending transversely of said spacer band, and spaced elongated members extending generally longitudinally of said spacer band and connected to said members extending substantially transversely of said spacer band, said members being relatively laterally offset to permit adequate flow of said gas between adjacent convolutions of said coil transversely of said convolutions, and contacting and supporting said spaced convolutions at a plurality of locations sufficiently closely spaced essentially to prevent contact of adjacent convolutions with each other, and being free of sharp edges or protrusions that can harm the surfaces of said strip in said coil convolutions.



3,923,557

CORROSION RESISTANT ALUMINUM ALLOYS

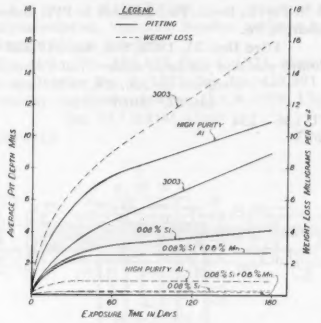
William H. Anthony, and Popplewell, both of Guilford, Conn., assignors to Swiss Aluminum Limited, Chippis, Switzerland

Continuation-in-part of Ser. No. 414,862, Nov. 12, 1973, Pat. No. 3,878,871. This application Mar. 14, 1974, Ser. No. 451,074

Int. Cl.[2] C22C *21/02*

U.S. Cl. 148—32 **7 Claims**

1. A corrosion resistant aluminum base alloy resistant to pitting and corrosion in an aqueous environment consisting essentially of from 0.05 to 0.5% silicon, wherein the silicon is present in solid solution, from 0.2 to 0.8% manganese, from 0.001 to 0.2% iron, from 0.001 to 0.1% chromium, from 0.001 to 0.1% magnesium, from 0.001 to 0.1% copper, from 0.001 to 0.05% titanium, from 0.001 to 0.1% zinc, balance aluminum.



3,923,558

COPPER BASE ALLOY

Stanley Shapiro, New Haven; Michael J. Pryor, Woodbridge, and Ronald N. Caron, Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 25, 1974, Ser. No. 445,447

Int. Cl.[2] C22C *9/02;* **C22D** *1/08*

U.S. Cl. 148—32.5 **8 Claims**

1. A copper base alloy in the wrought condition characterized by good hot rollability, good stress corrosion resistance, good strength properties and good bend characteristics consisting essentially of: tin from 2 to 11 percent; phosphorus from 0.01 to 0.3 percent; a transition metal selected from the group consisting of chromium, zirconium, titanium, vanadium and mixtures thereof in an amount from 0.2 to 0.8 percent each; and a material selected from the group consisting of iron and cobalt and mixtures thereof in an amount from 0.3 to 2.0 percent each, wherein the total of iron plus cobalt must be at least 0.8 percent; balance copper, said alloy having a grain size less than 0.010 mm, said alloy containing particulate phases uniformly dispersed throughout the matrix thereof wherein a first of said phases contains an iron and/or cobalt-transition metal intermediate phase comprising a solid solution of said iron and/or cobalt plus transition metal and wherein a second of said phases contains iron and/or cobalt-transition metal phosphides.

3,923,559

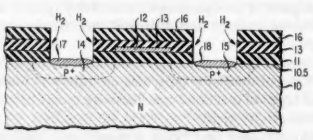
USE OF TRAPPED HYDROGEN FOR ANNEALING METAL-OXIDE-SEMICONDUCTOR DEVICES

Ashok Kumar Sinha, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 13, 1975, Ser. No. 540,643

Int. Cl.[2] H01L *21/324*

U.S. Cl. 148—1.5 **10 Claims**



1. In a process of manufacturing a semiconductor device, the device including a semiconductive silicon substrate a major surface of which is coated by a composite electrically insulating layer, the composite insulating layer including a

layer of silicon dioxide formed upon the major surface of the substrate and a protective layer formed on the layer of silicon dioxide, the protective layer having apertures which contain electrodes deposited in the apertures, the layer of silicon dioxide being sealed by the combination of the protective layer and the electrodes against the introduction into the layer of silicon dioxide of a gas which is useful in a heat treatment for repairing damage in the silicon substrate including damage caused by the deposition of the electrodes, the step of:

introducing the gas into the layer of silicon dioxide prior to the deposition of the electrodes.

3,923,560

LOW-CARBON STEEL SHEETS TEMPER-ROLLED AFTER THE FINAL ANNEAL TO IMPROVE MAGNETIC PROPERTIES

Lester J. Regitz, Penn Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 136,805, April 23, 1971, abandoned. This application Dec. 2, 1975, Ser. No. 372,432

Int. Cl.² H01F *1/00*

U.S. Cl. 148—120 **4 Claims**

1. A process for producing low-carbon sheet steel for magnetic applications consisting of; forming a steel slab consisting of 0.02 to 0.10 percent carbon, 0.40 to 0.60 percent manganese, 0.02 to 0.09 percent phosphorus, 0.025 maximum percent sulfur, 0.010 maximum percent silicon and the balance iron and residual impurities; hot rolling said slab to a thickness of 0.050 to 0.100 inch with a finishing temperature within the range 1430° to 1620°F; coiling the hot rolled steel at a temperature of 900° to 1200°F; cooling the coiled steel to ambient temperature; cleaning the steel to remove mill scale; cold rolling the cleaned steel to effect a thickness reduction of 40 to 80 percent; annealing the cold rolled steel at a temperature of 1125° to 1300°F to effect recrystallization thereof; and finally temper rolling the annealed steel sufficient to effect a plastic elongation of 6 to 10 percent to improve the steel's magnetic properties such that at 18.5 mils the steel will exhibit a permeability in excess of 6000 with core losses of less than 1.3 watts/lb. when subjected to an induction of 10 kilogauss, and exhibit a permeability in excess of 4000 with core losses of less then 3.0 when subjected to an induction of 15 kilogauss; while at 25 mils the steel will exhibit a permeability in excess of 4800 with core losses less than 1.8 when subjected to an induction of 10 kilogauss and exhibit a permeability in excess of 3000 with core losses less than 4.2 when subjected to an induction of 15 kilogauss.

3,923,561

METHOD OF HEAT TREATING SAW

Toushichi Ishizawa, and Seiya Ishizawa, both of 1-289, Kutsunoya, Shizuoka, Shizuoka, Japan

Filed May 8, 1973, Ser. No. 358,311

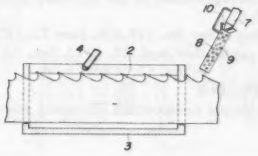
Claims priority, application Japan, Aug. 17, 1972, 47-81853; Aug. 17, 1972, 47-81852; Apr. 28, 1973, 48-48871

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C22D *9/24*

U.S. Cl. 148—147 **6 Claims**

1. A method of heat-treating saws comprising the steps of placing the saw in a cooling liquid such that the tooth ends project no more than about 2 mm above the liquid surface while keeping the other tooth portion as well as the saw body submerged in the cooling liquid, blowing gas on said said saw tooth portion so as to form a 1 to 2 mm deep depression or hollow in the liquid surface surrounding said saw tooth end portion to thereby let said tooth end portion rise up higher above the liquid surface, heating said portion to the hardening temperature while maintaining the above-said condition, then separating said heated tooth end portion away from the heating means and the depression forming means to allow the depressed liquid surface around the tooth end portion to



restore the normal planar state to thereby quench the heated tooth end portion.

3,923,562

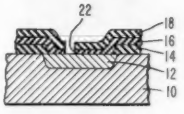
PROCESS FOR PRODUCING MONOLITHIC CIRCUITS

Vir A. Dhaka, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 765,574, Oct. 7, 1968, abandoned. This application June 24, 1971, Ser. No. 156,504

Int. Cl.² H01L *21/223*

U.S. Cl. 148—187 **7 Claims**



7. The process of claim **6** wherein the layer of second material is formed concomitantly with the diffusion of the active impurity.

3,923,563

PROCESS FOR DOPING SILICON SEMICONDUCTORS USING AN IMPREGNATED REFRACTORY DOPANT SOURCE

Doulatabad A. Venkatu, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 16, 1973, Ser. No. 351,348

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H01I *7/36*

U.S. Cl. 148—189 **16 Claims**

1. In the process for doping a silicon semiconductor wherein a silicon semiconductor and a solid dopant source for vapor phase transport of an N-type dopant are maintained in vapor phase communication at a temperature and for a time sufficient to form a zone of N-type conductivity in said semiconductor, the improvement wherein said solid dopant source comprises a porous, inert, rigid, dimensionally stable, refractory support having a volume porosity in the range of about 30 percent to about 80 percent and an average pore size diameter of about 1 micron to about 10 microns, said support having been formed by compacting and sintering a refractory oxide powder, said support being impregnated with a dopant component comprising aluminum metaphosphate, arsenic oxide, or antimony oxide, said dopant component being present in the proportion of at least about 20 parts by weight of said support.

3,923,564
DOUBLE BASE PROPELLANT WITH THORIUM CONTAINING BALLISTIC MODIFIER

Robert Lantz, Chester, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 155,639, June 22, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 398,920

Int. Cl.[2] C06D *5/06*

U.S. Cl. 149—19.8 **4 Claims**

1. A propellant composition consisting essentially of:

	% by weight
Nitrocellulose 12.2% to 14.6% N	40–60
Nitroglycerin	10–30
Plasticizer	10–30
Thorium ballistic modifier, based on thorium content	0.1–10
Carbon black	small amount
Heterocyclic nitramine crystalline explosive filler	0–10
Stabilizer	1–5

wherein said thorium ballistic modifier is an organic thorium compound of the group consisting of thorium malonate, thorium malate, thorium tartrate, thorium cyclopentane carboxylate, thorium stearate, thorium salicylate, thorium resorcylate, thorium succinate, thorium pimelate, thorium adipate and mixtures thereof, said propellant composition having a heat of explosion less than 900 calories per gram and exhibiting mesa or plateau ballistic properties.

3,923,565
SENSITIZED SLURRY EXPLOSIVE COMPOSITION

Hiroshi Sakai; Fumio Takeuchi, and Tsutomu Hanake, all of Aichi, Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 531,070

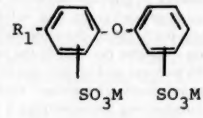
Claims priority, application Japan, Dec. 10, 1973, 48-138008; Dec. 10, 1973, 48-138009; Dec. 10, 1973, 48-138010

Int. Cl.[2] C06B *31/30*

U.S. Cl. 149—60 **10 Claims**

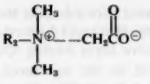
1. A slurry explosive composition comprising an inorganic oxidizing acid salt, water, a combustible material selected from the group consisting of liquid or powdered organic combustible materials and powdered inorganic combustible materials, a thickener and a sensitizer selected from the group consisting of

1. alkali metal salts of alkyldiphenyl ether disulfonic acid having the following general formula



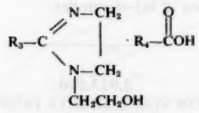
wherein R_1 represents an alkyl group having 8–24 carbon atoms and M represents an alkali metal,

2. dimethylalkylbetaines having the following general formula



wherein R_2 represents an alkyl group having 8–24 carbon atoms, and

3. fatty acid salts of 1-hydroxyethyl-2-alkylimidazoline having the following general formula



wherein R_3 represents an alkyl group having 8–24 carbon atoms and R_4 represents a hydrogen atom or an alkyl group having 1 or 2 carbon atoms.

3,923,566
METHOD OF FABRICATING AN APERTURED MASK FOR A CATHODE-RAY TUBE

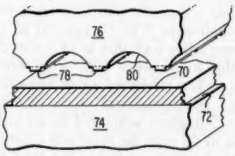
Harold Bell Law, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 21, 1972, Ser. No. 264,833

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—3 **14 Claims**



1. A method of fabricating an apertured mask for a cathode-ray tube comprising:

embossing a relief pattern on one side of a flat metal sheet with an embossing tool, said relief pattern providing regions of minimum thickness relative to the remaining regions thereof at intended aperture location and straight vertical sides perpendicular to the flat dimension of said sheet surrounding the intended aperture locations;

shaping said metal sheet into a desired mask contour;

masking the pattern side of said metal sheet with an etch-resistant material; and

etching the opposite side of said metal sheet until said regions of minimum thickness are etched through to provide apertures.

12. A method of fabricating an apertured mask for a cathode-ray tube comprising;

embossing a relief pattern on one side of a metal sheet comprising two laminated metal layers having a plurality of spaced parallel wires therebetween, said relief pattern providing regions of minimum thickness relative to the remaining regions thereof at intended aperture locations;

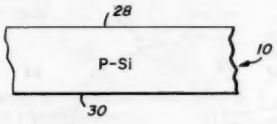
shaping said metal sheet into a desired mask contour; and

etching the opposite side of said metal sheet until said regions of minimum thickness are etched through to provide apertures.

3,923,567
METHOD OF RECLAIMING A SEMICONDUCTOR WAFER

John E. Lawrence, Cupertino, Calif., assignor to Silicon Materials, Inc., Mountain View, Calif.

Filed Aug. 9, 1974, Ser. No. 496,072
Int. Cl.[2] H01L 7/50
U.S. Cl. 156—7 11 Claims



1. A method of reclaiming a semiconductor wafer comprising the steps of:
stripping all external layers from said wafer;
gettering said wafer so as to draw excess point defects towards the surfaces of said wafer; and
etching the surfaces of said wafer so as to effectively remove the contaminants that were drawn toward said wafer surfaces.

3,923,568
DRY PLASMA PROCESS FOR ETCHING NOBLE METAL

Richard L. Bersin, Kensington, Calif., assignor to International Plasma Corporation, Hayward, Calif.

Filed Jan. 14, 1974, Ser. No. 432,953
Int. Cl.[2] C23F 1/00
U.S. Cl. 156—8 10 Claims

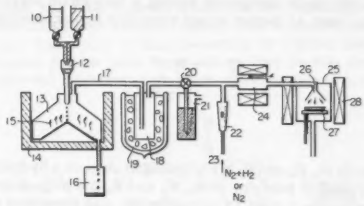
7. The process for producing an electrically conductive pattern on an electrically nonconductive substrate comprising:
a. forming a film of electrically conductive noble metal selected from the group consisting of gold, platinum, palladium, and silver on an electrically nonconductive substrate,
b. providing a film of resist over the film of noble metal with the film of resist covering those areas where the noble metal is to remain and leaving those areas where the noble metal is to be removed uncovered by resist, and
c. contacting the exposed noble metal with a plasma consisting essentially of fluorine, chlorine and not more than 25% oxygen by volume for a time sufficient to remove the exposed noble metal.

3,923,569
METHOD OF ETCHING A SEMICONDUCTOR ELEMENT

Takuhiro Ono, and Masafumi Hashimoto, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 17, 1973, Ser. No. 361,265
Claims priority, application Japan, May 18, 1972, 47-49612
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] H01L 5/00
U.S. Cl. 156—17 7 Claims

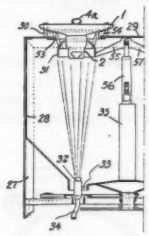
1. A method of gas-etching, which comprises applying and etching gas composed of NOCl and Cl_2, which is generated through the reaction of HCl and HNO_3, onto a semiconductor substrate while maintaining the temperature of said semiconductor substrate at a predetermined temperature above the boiling point of up to 400° C.



3,923,570
MANUFACTURE OF INSULATORS

Michel Willem, Cusset, France, assignor to Societe Europeenne d'Isolateurs en Verre (SEDIVER), France

Continuation of Ser. No. 654,567, July 19, 1967, abandoned.
This application Jan. 30, 1973, Ser. No. 328,003
Claims priority, application France, Aug. 1, 1966, 71.671
Int. Cl. B32b 31/16
U.S. Cl. 156—73.6 4 Claims



1. The method of assembling an insulator comprising a hollow metallic cap member, a dielectric body having a hollow crown adapted to fit within said cap member, and a stem member fitting at one end within said hollow crown, which comprises disposing said cap member, body, and stem member in telescoping relation with the body between said cap and stem members and with a quantity of cement between the cap member and body, and with a further quantity of cement between the body and stem member, and applying vibratory motion directly to the body without passage through either of said members.

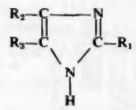
3,923,571
METHOD OF USING AN EPOXY-RESIN-IMIDAZOLE SOLDER MIXTURE

Hiroyuki Aoki, Yokosuka; Takeshi Mottate; Masao Nakajima, both of Yokohama; Kadru Ebisui, Takatsuki, and Satoshi Nishikawa, Osaka, all of Japan, assignors to Nissan Motor Company Limited, Yokohama and Sunstar Chemical Industry Co., Ltd., Takatsuki, both of, Japan

Division of Ser. No. 212,694, Dec. 27, 1971, abandoned. This application Mar. 14, 1973, Ser. No. 341,011
Claims priority, application Japan, Dec. 27, 1970, 45-127867; Dec. 27, 1970, 45-127868; Dec. 27, 1970, 45-127869
Int. Cl.[2] B32B 35/00; B44C 1/20
U.S. Cl. 156—94 6 Claims

1. A process for soldering an article, which comprises applying to the article to be soldered a fabricated article of a tacky, plastic and heat curable one-part epoxy resin soldering mate-

rial composition consisting essentially of a mixture of 100 parts by weight of an epoxy resin having at least one epoxy group per molecule and 1 to 30 parts by weight of a normally solid imidazole compound having a long-chain alkyl group with at least 15 carbon atoms expressed by the formula:



wherein R_1, R_2 and R_3 are a hydrogen atom or a hydrocarbon group, and at least one of R_1, R_2 and R_3 is a long-chain alkyl group having at least 15 carbon atoms, said fabricated article having a strippable backing film on one surface, pressing the fabricated article against the article to be soldered and bringing them into intimate adhesion to each other, extending the fabricated article, and heat-curing it with or without prior removal of the backing film.

3,923,572

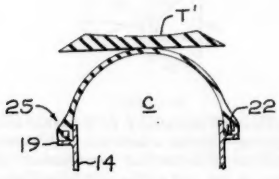
METHOD AND APPARATUS FOR BUILDING TIRES

Richard F. Garver, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 338,767, March 7, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 532,883

Int. Cl.² B29H *17/16, 17/26*

U.S. Cl. 156—128 **4 Claims**



1. A tire building apparatus comprising a support, said support having a pair of laterally spaced nonyieldable rim flanges mounted thereon for movement in an axial longitudinal direction toward and away from each other with said flanges operative to support a tire carcass therebetween, drive means connected to said rim flanges for rotating said rim flanges, each of said rim flanges being recessed to provide annular outwardly extending bead seats relative to the center of the drum for supporting the annular beads of a cylindrically shaped tire carcass, said annular outwardly extending bead seat being L-shaped in cross section with the respective vertically extending portion of said spaced flanges being back to back and the respective horizontally disposed portions extending outwardly away from said vertical portion, and away from each other. Transmission means on said support operatively connected to said flanges for rotating said flanges simultaneously and for selectively moving said flanges the same longitudinal distance toward each other or away from each other, and means for pressurizing a chamber defined by said flanges and a tire carcass held by said flanges.

3,923,573

METHOD AND APPARATUS FOR CONSTRUCTION

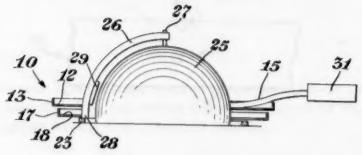
Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 1, 1972, Ser. No. 302,836

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B31C *13/00;* **B29C** *23/00*

U.S. Cl. 156—192 **6 Claims**



1. In a method for the fabrication of a spirally generated structure wherein a strip of structural material is deposited successively in a plurality of turns, and adjacent turns bonded to each other to form a unitary structure by means of a material depositing head moving in a generally helically spiral pattern, the improvement which comprises

providing a first generally endless conveyor disposed about at least a portion of the structure,

providing a second conveyor within said first conveyor and the second conveyor being generally co-extensive therewith,

providing to one conveyor a first strip of structural material having a length at least about one quarter the length of the conveyor,

passing the first strip to the depositing head and

supplying a second strip of structural material to the remaining conveyor, and subsequently

passing the second strip to the depositing head and

providing another strip to replace the first strip on the one conveyor.

6. An appartus suitable for handling elongate strip-like materials useful for the preparation of a spirally generated structure, the apparatus comprising

a first conveyor of generally circular closed cell configuration having an upwardly facing material receiving surface, a second conveyor disposed within the first conveyor and of generally like configuration to the first conveyor and having a generally upwardly facing material receiving surface, the material receiving surfaces of the first and second conveyors being generally composed of a plurality of rolls, the material receiving surface of the second conveyor being displaced below the surface of the first conveyor by a distance approximating the thickness of strip-like material to be handled.

3,923,574

METHOD OF BONDING AN IONOMER FILM TO A NON-IONOMER FILM USING A POLYALKYLENEIMINE

Joseph Vercauteren, New Milford, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

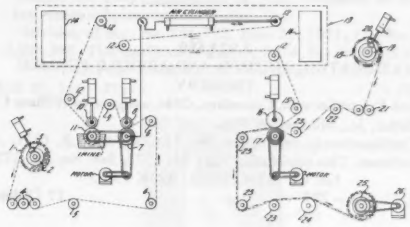
Division of Ser. No. 835,944, June 24, 1969. This application May 21, 1974, Ser. No. 471,889

Int. Cl.² B65H *81/00;* **B32B** *31/14;* **C09J** *5/00*

U.S. Cl. 156—192 **6 Claims**

1. In a process for the production of a structured film wherein an ionomer film and a non-ionic polymer film are bonded together using a polyalkyleneimine at the interphase to promote adhesion and the structured film is wound onto a

roller after bonding, the improvement wherein the polyalkyleneimine is applied to a surface of one of said films as an



aqueous solution that contains about 0.01 to 2 percent by weight of said polyalkyleneimine.

3,923,575

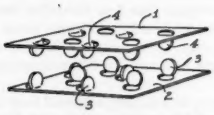
METHOD OF FORMING A BOARD STRUCTURE COMPRISING SPACED PANELS JOINED BY INTERVENING TABS

William A. Wootten, 425 Via Corta, Malayo Cove Plaza, P.O. Box 98, Palos Verdes Estates, Calif. 90274

Division of Ser. No. 170,120, Aug. 9, 1971, Pat. No. 3,846,218. This application Nov. 4, 1974, Ser. No. 521,001

Int. Cl.[2] **B31F** *3/00, 5/00*

U.S. Cl. 156—211 **13 Claims**



1. The method of forming a structural member comprising the steps of partially perforating a pair of flat panels to form a plurality of tab areas in each said panel, said perforating step, for each said tab area, leaving an unperforated portion in said panel which is adapted to act as a hinge line for said tab area and severing a further portion of said panel along a continuous line extending between the ends of said hinge line to define a tab, said perforating step producing like patterns of said tab areas in said pair of panels respectively with hinge lines in each pattern being disposed at angles to one another, positioning said pair of panels in spaced, facing relation to one another with said like patterns of tab areas being in substantially opposing relation to one another, bending the tab areas in said panels about their respective hinge lines to form a plurality of tabs which extend in a plurality of angularly disposed planes, each of which is positioned at substantially right angles to each panel, into the space between said panels, each tab extending from one of said panels being disposed in facing, closely adjacent, substantially completely overlapping, relation to a corresponding tab extending from the other of said panels, and fastening each tab extending from said one of said panels to the corresponding tab extending from the other of said panels.

3,923,576

WEATHERSEAL MANUFACTURE

Earl V. Lind, Rochester, N.Y., assignor to The Schlegel Manufacturing Company, Rochester, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,301

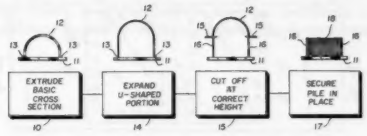
Int. Cl.[2] **B29F** *3/08*

U.S. Cl. 156—244 **4 Claims**

1. A weatherseal making method comprising:

a. extruding a resin base with a relatively thick and generally flat support portion and a relatively thin portion U-shaped in cross section and joined to opposite side edge regions of said support portion and arching over one face surface of said support portion;

b. while said resin material is still plastic, producing a substantially lower pressure outside said U-shaped portion than inside said U-shaped portion to expand said U-shaped portion away from said support portion and reduce the thickness of the wall of said U-shaped portion;



c. setting said resin material with said U-shaped portion expanded;

d. cutting off each side of said U-shaped portion at a predetermined distance from said support portion to leave a pair of thin, spaced-apart, resilient fins extending away from said one face surface of said support portion; and

e. securing a fibrous pile material to said one face surface of said support portion between said fins.

3,923,577

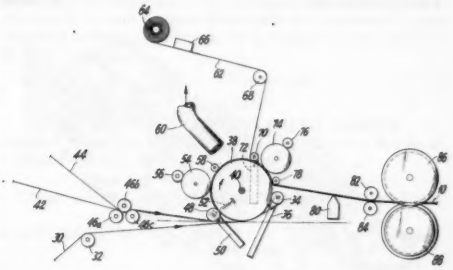
METHOD FOR MAKING A MULTI-COMPONENT ARTICLE

William E. Baab, Tulsa, Okla., assignor to Poly-Version, Inc., Tulsa, Okla.

Filed Apr. 2, 1973, Ser. No. 346,740

Int. Cl.[2] **B32B** *31/02, 31/04;* **A41D** *19/02*

U.S. Cl. 156—251 **4 Claims**



1. A method for manufacturing a unitary package containing at least two separately usuable articles of wearing apparel, said method comprising the steps of:

a. feeding a flexible support layer onto the surface of a moving carrier;

b. depositing a sufficient number of layers of a first material on the flexible support layer;

c. forming the first article in the shape of a glove from the first material while the first material is positioned on the flexible support layer such that the first article may be subsequently removed from the support layer and used independently thereof;

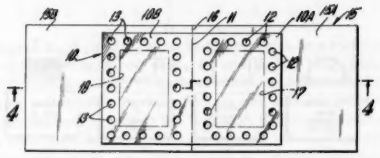
d. depositing a sufficient number of layers of a second material over the formed first article; and

e. forming the second article in the shape of a hat from the second material while the second material is positioned over the first formed article whereby the second formed article may be subsequently removed and be used independently of the first article.

3,923,578
METHOD OF HEAT SEALING SHEET-FORM LAYERS OF PERFORATED PLASTIC BETWEEN LAYERS OF PAPERBOARD

George R. Hair, 8 Kozy Lane, Clifton, N.J. 07013

Filed Sept. 14, 1972, Ser. No. 289,091
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—252 7 Claims

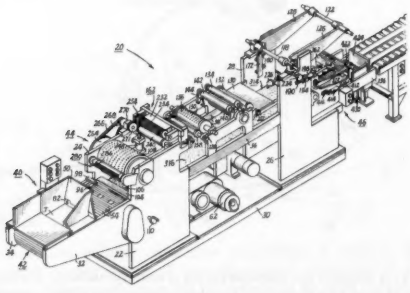


1. A method of heat sealing at least two superposed sheets of heat sealable plastic to the same layer of non-heat conducting material comprising the steps of perforating each sheet of plastic in a pattern such that, when the sheets of plastic are superposed for heat sealing, the perforations of each sheet of plastic are aligned with imperforate portions of a superposed perforated sheet of plastic; and applying sealing heat and pressure to the superposed sheets of plastic and non-heat conducting material.

3,923,579
METHOD FOR MAKING TILE PRODUCTS

Frank L. Califano, Hackensack, and Paul N. Shutak, Madison, both of N.J., assignors to The Flintkote Company, White Plaines, N.Y.

Division of Ser. No. 794,286, Jan. 27, 1969, Pat. No. 3,598,682. This application July 16, 1970, Ser. No. 62,765
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—263 7 Claims

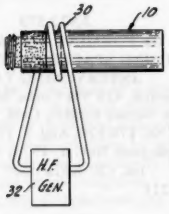


1. A method of producing a pressure-sensitive adhesive tile product comprising the steps of:
- conveying a succession of tiles at a uniform velocity along a straight-line path,
- moving a continuous web of protective paper at said uniform velocity past an adhesive applicator,
- coating said paper with an adhesive coating in a predetermined pattern,
- cutting said adhesive-coated protective paper to separate predetermined lengths while said web of paper is moving at said uniform velocity,
- moving said separate predetermined lengths of paper to a point in line with and at the same uniform velocity as said tiles, with the adhesive-coating side of the protective paper facing the tiles, and
- applying rolling contact pressure against the adhesive-coated paper to press it against the tiles while said tiles and said predetermined lengths of paper are continuously moving along at said uniform velocity.

3,923,580
FABRICATING METHOD AND ARTICLE FORMED THEREBY

Alfred F. Leatherman, Columbus, Ohio, assignor to William C. Heller, Jr., Milwaukee, Wis.

Continuation-in-part of Ser. No. 132,315, April 8, 1971, abandoned. This application May 22, 1973, Ser. No. 363,177
Int. Cl.[2] B29C *19/02*; B23K *13/02*
U.S. Cl. 156—272 17 Claims



1. A method of fabricating articles by thermally joining contiguous areas of at least first and second integral thermoplastic article parts, each of said parts having a joinder area portion and a non-joinder area portion, said method comprising the steps of:
- dispersing a particulate susceptor heatable upon exposure to a high frequency field in a thermoplastic material to define a modified thermoplastic material;
- forming the modified thermoplastic material into a first integral self-supporting article part having said joinder area portion completely including said susceptor and said non-joinder area portion completely including said susceptor, said self-supporting article part possessing utility in the article;
- juxtapositioning the first article part and the second article part so that the joinder area portions thereof are in close contact and said non-joinder area portion of said first article part projects laterally outwardly from said joinder area and said second article part having said non-joinder area projecting laterally outwardly from said joinder area portion in spaced relation to said non-joinder area portion of said article part, said non-joinder area portions defining spaced and separate self-supporting elements of the article possessing utility;
- aligning of a high frequency source means essentially only with the joinder area, and briefly exposing the joinder area portion of the first article part to the localized high frequency field with the adjacent lateral non-joinder area portion forming a field return path extended from the joinder area portion to raise the temperature of the surface of the joinder area contacting the second article part to a thermally bondable temperature and minimizing of heat generation and thermal distortion in the non-joinder portion of the first article part; and
- retaining the first and second article parts in contact until the parts are thermally joined into a single integrated article.

3,923,581

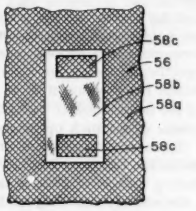
METHOD OF MAKING A THERMAL DISPLAY SYSTEM

Thomas R. Payne; Hubert R. Plumlee, both of Plano, and Millard M. Judy, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 156,772, June 25, 1971, Pat. No. 3,808,399. This application Jan. 9, 1974, Ser. No. 432,017

Int. Cl.² B32B 31/04, 7/14; H05B 3/02

U.S. Cl. 156—291 1 Claim



1. In the fabrication of a thermal display device including a substrate and an array member having a plurality of selectively energizable heater elements and adapted to be connected to the substrate which serves as a heat sink therefor, the method of bonding said array member to said substrate comprising:

applying a quantity of uncured adhesive material as a layer of substantially uniform thickness to a predetermined area of a surface of one of said substrate and said array member to be connected to an opposed surface of the other of said substrate and said array member,

placing said array member and said substrate together with the opposed surfaces thereof in juxtaposition and the layer of uncured adhesive material interposed therebetween,

positioning a tool having a plurality of probes disposed in a single and at least one other probe having its end positioned above the plane in which said plurality of probes are dispoed by a distance equal to the predetermined thickness of said array member and said layer of adhesive material such that said plurality of probes disposed in a single plane are located in engagement with the portion of said substrate surface bounding the layer of adhesive material and said array member and said at least one other probe is in engagement with the opposite surface of said array member,

locating the opposed surfaces of said array member and said substrate in a predetermined relation with the layer of uncured adhesive material interposed therebetween and having a predetermined uniform thickness by pressing said tool against the opposite surface of said array member and said substrate surface, and

curing the adhesive material to produce a bonded connection between said array member and said substrate with a layer of cured adhesive material interposed therebetween of a uniform predetermined thickness so as to exhibit uniform thermal conductivity characteristics.

3,923,582

LABELLING APPARATUS FOR PRINTING DISPENSING AND AFFIXING OF LABELS

Carl Schroter, Rommelshausen, and Eckhard Mulfinger, Stuttgart-Uhlbach, both of Germany, assignors to Heinrich Hermann, Stuttgart, Germany

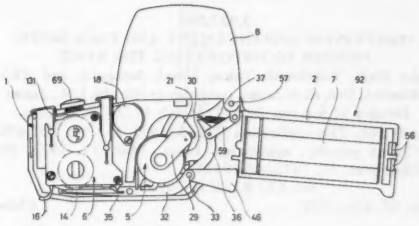
Filed Oct. 29, 1973, Ser. No. 410,317

Claims priority, application Germany, Nov. 2, 1972, 2253565; Nov. 2, 1972, 2253566; Nov. 2, 1972, 2253623

Int. Cl.² B65H 5/28

U.S. Cl. 156—368 23 Claims

1. A labelling apparatus for printing, dispensing and affixing of labels which are detachably carried on a carrier tape, comprising a housing; supply means in said housing for supplying a carrier tape with the detachable labels thereon; printing means mounted in said housing and including a plurality of turnable printing wheels past which said tape travels from said supply means; affixing means downstream of said printing means for detaching the printed labels from said tape and affixing them to an object to be labelled; and drive means downstream of said affixing means for incrementally advancing said carrier tape past said printing wheels in proximity therewith, said drive means comprising a drive wheel adapted to be driven, a lever mounted in said housing for angular displacement about a pivot axis and having an arm engaged by said drive wheel, a rotatable drum having a periphery over which said tape passes, an engaging member for intermittently



engaging said tape into frictional engagement with said periphery so that the tape is entrained by the rotating drum, and a pressure plate located adjacent said printing wheels proximal to a side of said tape which is opposite the same, and intermittently movable towards said printing wheels substantially simultaneously with said intermittent operation of said engaging member so as to urge said tape and the respective label thereon into engagement with said printing wheels for printing by the same, whereby the amount of time and the energy required to operate the labelling apparatus are substantially minimized due to the substantial simultaneity of the movement of said pressure plate with the operation of said engaging member, and due to the proximity of said pressure plate to said tape.

3,923,583

MACHINE FOR THE COUPLING OF FABRICS

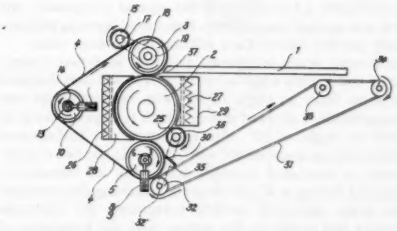
Giacomo Bianchini, Via S. Bernardo 22, Cascina Nuova di Bollate (Milan), Italy

Filed Feb. 14, 1973, Ser. No. 332,386

Claims priority, application Italy, Feb. 16, 1972, 20627/72

Int. Cl.² B32B 31/04

U.S. Cl. 156—378 7 Claims



1. In a machine for the coupling of a fabric with an interlining by means of the interposition of an adhesive layer including a compressing device and a heating device, said compressing device including: upper, central and lower rollers with axes fixedly disposed in the same plane, a guide roller displaced from the plane of the said upper, central and lower rollers, a

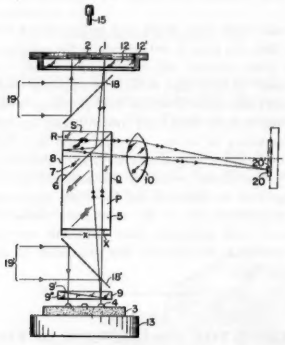
continuous belt disposed about the surfaces of said upper and lower rollers on one side of said plane and on the surface of said central roller on the remaining side of said plane, said lower roller being the drive roller for said belt, means for yieldingly urging said front roller away from said central roller whereby slack in said belt is taken up, second means for yieldingly urging said lower roller toward said central roller whereby the fabrics to be coupled having been received between said belt and said central roller is maintained in contact therewith; and said heating device including: two infra-red ray heaters disposed on opposite sides of said central roller; a probe in contact with said central roller indicating the temperature thereof and an exit conveyor which is continuous and tangential with said belt.

3,923,584

POSITIONING ARRANGEMENT AND FACE DOWN BONDER INCORPORATING THE SAME

Toku Hojo, Yokohama; Takao Matui, Setagaya, and Rikiti Kimura, Ota, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 20,337, March 17, 1970, Pat. No. 3,684,384. This application Mar. 3, 1972, Ser. No. 231,475
Claims priority, application Japan, Mar. 17, 1973, 48-19566; Mar. 17, 1973, 48-19567
Int. Cl.[2] B32B *31/00, 19/02*
U.S. Cl. 156—379 **1 Claim**



1. A bonding arrangement for aligning first and second components to be mated and bonding said components together in registration, comprising:

a first holder for holding thereon the first component so as to expose upwardly an upper face of the first component; a second holder positioned above the first holder for holding thereon the second component so as to expose downwardly a lower face of the second component, the first and second components being held apart is substantially parallel face-to-face relationship to each other;

a compound prism interposed between said two components and having a half-silvered mirror which is disposed so as to form an angle of 45° with respect to the two components, a silvered mirror which is disposed so as to form an angle of 45° with respect to the half-silvered mirror and an angle of 90° with respect to the two components, a truncated quadrilateral prism of transparent material having a 45° truncation, a rectangular transparent prism having a surface subtending the rectangle thereof and united at the surface with the truncation of the truncated prism into a parallelopiped shape, said half-silvered mirror film being formed at the interface between the truncated prism and the rectangular prism, and a totally reflective mirror film serving as the silvered mirror and provided on one of two mutually perpendicular surfaces of the rectangular prism, said one of the two surfaces being opposite to a side of the truncated prism and the other one forming a top of the compound prism which is opposite to the base of the truncated prism;

imaging means disposed in front of said silvered mirror of the compound prism in such a manner that the half-silvered mirror is interposed between the imaging means and the silvered mirror for forming images of the upper face of the first component and the lower face of the second component superposed on each other;

illumination means for illuminating said two components, respectively;

pick up means for picking up the second component from the second holder and being mounted for moving the second component thus picked up in a direction up and down perpendicular to the first component;

centering means for moving at least one of the pick up means and the second holder with respect to the other so that the center of the pick up means is aligned with the center of the second component on the second holder before it is picked up;

position adjusting means for moving said first holder vertically and horizontally with respect to the second holder under maintenance of the mutually parallel relationship therebetween;

removing means for moving the compound prism and the second holder to anout-of-the-way position between the two components, so that the second component is contacted to the first component by the downward movement of the pick up means; and

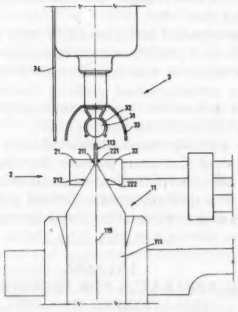
means for supplying ultrasonic oscillation power to said pick up means while the two components are mated together.

3,923,585

METHOD AND APPARATUS FOR THE CLOSING BY TRAMSVERSE WELDING OF FLEXIBLE TUBES MADE OF METAL-THERMOPLASTIC LAMINATE

Jean-Marie Vouillemin, Ste-Menehould, France, assignor to Turboplast-France, Paris, France

Division of Ser. No. 342,689, March 19, 1973, Pat. No. 3,837,961. This application June 3, 1974, Ser. No. 475,425
Claims priority, application France, Mar. 23, 1972, 72.10240
Int. Cl.[2] B32B *19/02, 31/00*
U.S. Cl. 156—380 **3 Claims**



1. Apparatus for closing the open end portion of flexible tubes formed with a thermoplastic interlayer by transverse welding of the flexible tube comprising

1. a pair of jaws mounted for movement into and out of gripping engagement with the opposite side of a portion of the tube adjacent the open end to flatten and to grip the flattened end portion of the tube with a free end portion extending beyond the jaws when in gripping engagement;

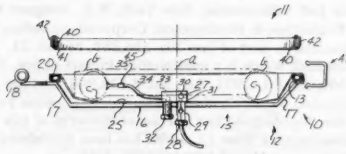
2. an infrared radiation means beyond the gripping jaws for directing radiations onto the free flattened end portion of the tube extending beyond the jaws to pre-heat said portion, and

3. a pair of welding jaws mounted for movement into and out of engagement with the pre-heated flattened free end portion of the tube extending beyond the gripping jaws, at least one of said welding jaws embodying induction heating means additionally to heat the free flattened end portion of the tube extending beyond the gripping jaws and to weld the same when in position of engagement with the tube, said welding jaws also embodying cooling means for setting the weld.

3,923,586
EVACUABLE MEMBRANE APPARATUS FOR TIRE RECAPPING

Jerome A. Gross, 6304 S. Rosebury, Clayton, Mo. 63101

Continuation-in-part of Ser. No. 374,675, June 28, 1973, Pat. No. 3,847,695. This application Oct. 21, 1974, Ser. No. 516,188
Int. Cl.² B29H *17/00*
U.S. Cl. 156—394 **4 Claims**



1. For use in a pressurizable chamber for vulcanizing a pre-formed tread strip to a tire casing containing an inner tube,

evacuable membrane apparatus comprising

an upper and a lower air-impermeable casing-enveloping membrane, each having a normally planar outer margin extending beyond such tire casing, at least one of said membranes having an air evacuation outlet and a tube communicating therefrom to the outer side of such pressure chamber, and having an air inlet having a conduit between said membranes and connectable to such inner tube, together with

a rigid fixture comprising

a resilient pressure rim whose radius does not exceed that of the radially outer membrane portions, the rim having a continuous resilient face, the fixture further including

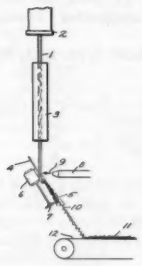
a circular pressure bar hoop narrower than the width of the resilient face of the rim and of such radius as to fit therewith,

means to secure the hoop in position relative to the rim, and means to apply pressure between the pressure bar hoop and the resilient face of the rim, whereby to clamp therebetween the margins of the upper and lower membranes sealedly at a pressure in excess of the pressure of such vulcanizing chamber.

3,923,587
APPARATUS FOR THE MANUFACTURE OF CONTINUOUS FILAMENT NONWOVEN WEB

Pierre Porte, Lyon, France, assignor to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 320,843, Jan. 4, 1973, Pat. No. 3,853,651. This application Mar. 28, 1974, Ser. No. 455,810
Claims priority, application France, Jan. 4, 1972, 72.00264
Int. Cl.² B65H *33/02*
U.S. Cl. 156—433 **10 Claims**

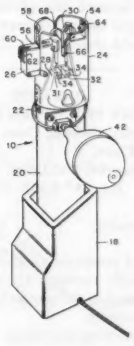


1. Apparatus for making spunbonded nonwoven fabrics, said apparatus comprising means for producing a plurality of filaments of an organic polymer, means for stretching said filaments to orient same, moving receiving means, and deflector surface means associated with said stretching means for distributing the stretched filaments on said moving receiving means by impacting said filaments on said deflector surface means, at least that portion of said deflector surface means wherein the plurality of filaments have their maximum width being vibrated in a substantially vertical plane at a frequency of 1.67 – 1000 vibrations per second at an amplitude of 5 – 30% of the length of the deflector surface means.

3,923,588
YARN SPLICER

William P. Warthen, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 1, 1974, Ser. No. 493,511
Int. Cl.² B65H *21/00, 69/06*
U.S. Cl. 156—502 **5 Claims**



1. A yarn splicing apparatus comprising: a resistance heating element having an area to accommodate at least two synthetic yarns to be spliced, a source of power, means to supply power from said source of power to said heating element and means to supply a cooling medium to said area to accommodate the synthetic yarns, said means to supply power from

said source of power including a microswitch mounted on said apparatus in a position to be actuated by one of the yarns being spliced.

3,923,589

APPARATUS FOR COATING LABELS WITH ADHESIVE AND APPLYING THEM TO OBJECTS SUCH AS BOTTLES

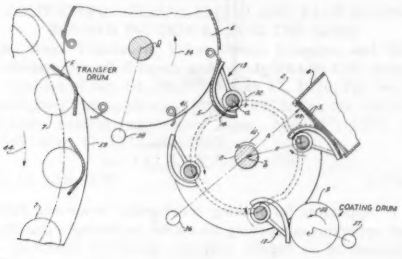
Georges Antoine Tavernier, Lyon, France, assignor to Societe Anonyme Societe Nouvelle Baele Gangloff, Villeurbanne, France

Filed Feb. 13, 1974, Ser. No. 441,966

Claims priority, application France, Feb. 14, 1973, 73.05857

Int. Cl.[2] B65C *9/16, 9/22;* **B65H** *3/20*

U.S. Cl. 156—568 **9 Claims**



1. An apparatus for picking up a flat flexible sheet, said apparatus comprising:

a turntable;

means for rotating said turntable about a turntable axis;

a stationary magazine holding a stack of sheets adjacent said turntable;

at least one pickup head on said turntable rotatable about a pickup axis spaced from said turntable axis and having a pickup face engageable with said stack of sheets and formed generally as a curved surface of varying radius of curvature;

means for rotating said head on said support about said pickup axis as same passes said magazine and for rolling said face over said stack without sliding of said face on said stack; and means for adhering the top sheet of said stack to said face whereby on rolling of said face thereover said sheet adheres to said face and is picked up by said head, said surface being defined by a family of parallel lines having a radius of curvature decreasing from a leading edge to a trailing edge.

3,923,590

DRY MOUNTING PRESS

Donald N. Humphries, Oxford, Conn., assignor to Seal Incorporated, Derby, Conn.

Filed May 14, 1973, Ser. No. 359,909

Int. Cl.[2] B30B *15/34*

U.S. Cl. 156—580 **14 Claims**

1. A press comprising:

a bed;

a platen assembly positioned above said bed;

hinge arms pivotally connected to the bed;

a cross-beam extending transversely of said hinge arms over said platen assembly;

pivot means connecting said hinge arms to said cross-beam so as to allow relative pivotal movement between said cross-beam and said hinge arms;

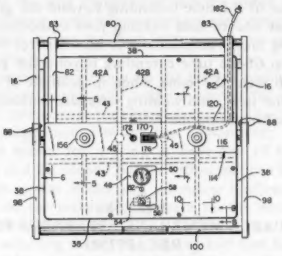
height-adjusting means located between and spaced from said hinge arms for locking said platen assembly to said cross-beam;

toggle links pivotally connected to opposite sides of said bed;

lever arms pivotally connected to said toggle links;

means connecting said cross-beam to said lever arms; and

means for pivoting said lever arms relative to said toggle links so as to selectively raise and lower said platen assembly into open and closed positions respectively relative to said bed; said height adjusting means comprising a stud affixed at one end to said platen assembly, and rotatable threaded means screwed onto said stud connecting said cross-beam to said stud, whereby the spacing between said cross-beam and said platen assembly can be varied by rotating said threaded means on said stud.



3,923,591

PREHYDROLYSIS AND DIGESTION OF FIBROUS LIGNOCELLULOSIC MATERIAL

Eduardo Joel Villavicencio, New York, N.Y., assignor to Process Evaluation & Development Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 236,589, March 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 149,000, Juné 1, 1971, Pat. No. 3,738,908, and Ser. No. 220,390, Jan. 24, 1972, abandoned. This application Feb. 21, 1974, Ser. No. 444,668The portion of the term of this patent subsequent to June 12, 1990, has been disclaimed.

Int. Cl.[2] D21C *3/12, 3/26*

U.S. Cl. 162—86 **7 Claims**

1. A method for the production of cellulosic pulp from fibrous lignocellulosic material comprising prehydrolizing said lignocellulose material at a pH of about 4.0 to 6.0 in the presence of about 70 to 100 weight percent moisture based on the dry weight of said material, digesting the prehydrolized material with a sodium carbonate buffered aqueous digestion solution having a pH of 8.5 to 11.5 and a sodium oxide content of about 10 to 14 percent by weight, said aqueous digestion solution consisting essentially of about 1.1 to 3 moles of sodium bisulfite per mole of sodium hydroxide whereby during digestion the pH remains above about 8.5 and said sodium bisulfite and sodium hydroxide penetrate said fibrous lignocellulose material, react to form sodium sulfite, and digest said lignocellulose material.

3,923,592

PROCESS FOR MANUFACTURING A FLUSHABLE FIBROUS SHEET MATERIAL FOR USE IN SANITARY PRODUCTS

Donald K. George, Aiken, and Joseph H. Angel, Columbia, both of S.C., assignors to Riegel Textile Corporation, New York, N.Y.

Continuation of Ser. No. 95,388, Dec. 4, 1970, abandoned. This application July 31, 1974, Ser. No. 493,251

Int. Cl.[2] D21H *3/40, 3/00;* **A61F** *13/18*

U.S. Cl. 162—168 **3 Claims**

1. A process for producing a cellulosic sheet suitable for use in flushable sanitary products and being resistant to disintegration in use, and in which the sheet is formed on the machine wire of a paper machine, comprising incorporating in the white water system of the paper machine a high molecular

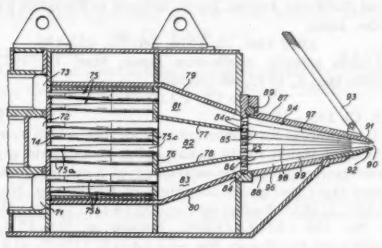
weight water soluble polymeric material in finely ground particulate form which hydrates and swells rapidly in cold water and which has cold water soluble components, said polymeric material being sufficiently finely ground to pass through a 50 mesh screen, permitting said polymeric material to remain in the white water for about three to 90 seconds to effect hydration and swelling of the polymeric particles but avoiding an excessive residence time in the white water sufficient to dissolve the water soluble polymer components or permit loss of the hydrated particles through the paper machine wire, forming on the paper machine wire a cellulosic fiber sheet containing the swollen polymeric particles, and subsequently drying the cellulosic sheet produced on the paper machine with the water soluble polymeric particles contained therein effecting bonding together of the cellulosic fibers in a sufficiently strong manner to prevent breaking of the bond through normal use in the sanitary products, but permitting flushing of the sanitary products after use by dispersing the polymeric particles and the cellulosic fibers in the flushing water.

3,923,593

MULTIPLE PLY WEB FORMER WITH DIVIDED SLICE CHAMBER

Herman Ward Verseput, Kalamazoo, Mich., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 204,545, Dec. 3, 1971, abandoned. This application Jan. 17, 1974, Ser. No. 434,048
Int. Cl.[2] D21F *1/06*
U.S. Cl. 162—301 **10 Claims**



1. In a machine for making a multi-ply web such as a paper from stocks having a slurry of fibers in a liquid carrier, the combination comprising:

a headbox having a lower wall and an upper wall;

a slice chamber connected to the headbox having a lower slice wall and an upper slice wall being extensions of the headbox walls, one of said slice walls being pivoted at its upstream edge with said slice walls tapered toward each other and terminating in a slice opening;

flow divider plates in the headbox extending completely across the headbox in the direction of flow and dividing the headbox into separate stock chambers;

separate stock supply means to each of said chambers for delivering stocks of different physical characteristics;

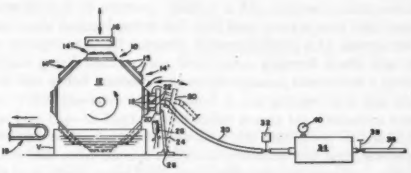
flexible sheet members in the slice chamber secured at their upstream ends in alignment with the plates with their downstream ends being unattached and extending to the slice opening whereby the stocks of the separate chambers do not intermix and remain separate for the full travel onto the forming surface and the pressure of the stock flows on opposite sides of said sheet members remains equal for uniform velocity flow at the slice opening; and a forming surface positioned to have stock discharged thereon from the slice opening.

3,923,594

METHOD FOR FORMING MOLDED FIBER PRODUCTS WITH DECKLE-FREE WINDOWS

Henry A. Lord, Cape Elizabeth, Maine, assignor to Diamond International Corporation, New York, N.Y.

Division of Ser. No. 264,190, June 19, 1972, Pat. No. 3,871,586. This application June 12, 1974, Ser. No. 481,851
Int. Cl.[2] D21J *3/00*
U.S. Cl. 162—195 **4 Claims**



1. The method of forming deckle-free windows in molded fiber products comprising the steps of:

a. applying pulp slurry on a forming mold provided with one or more block-out patches for forming one or more windows in the finished product;

b. moving said forming mold with pulp slurry applied thereon to a deckle removing position whereby deckle formed on said one or more block-out patches may be removed therefrom; and

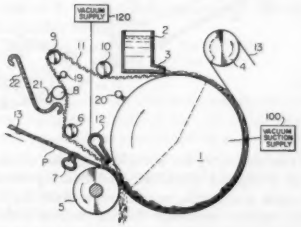
c. moving an air distributor manifold box with one or more jet tubes into very close proximity to said block-out patches and discharging high pressure air through each of said jet tubes against each of said block-out patches thereby blasting deckle off the top of each block-out patch, said high pressure air being discharged through said jet tubes with each of said jet tubes directed over the center of a block-out patch associated therewith whereby the air emitting from each jet tube strikes the top of the block-out patch and moves radially outwardly thereacross to sweep the deckle therefrom and over surrounding pulp portions clear of the block-out patch.

3,923,595

HIGH SPEED MULTI-CYLINDER MACHINE FOR MANUFACTURING A MULTI-PLY PAPER

Masateru Tokuno, Nishinomiya, Japan, assignor to Shizuoka-Kogyo Co., Ltd., Japan

Continuation of Ser. No. 74,302, Sept. 22, 1970, abandoned. This application Apr. 19, 1974, Ser. No. 462,260
Int. Cl.[2] D21F *1/60, 11/08*
U.S. Cl. 162—300 **4 Claims**



1. High speed multi-cylinder arrangement for manufacturing multi-ply papers comprising a plurality of cylinder parts, each cylinder part comprising a wire cylinder having an upper section and a lower section and rotating at a high speed, an endless wire screen first making contact with said wire cylinder at said upper section and encircling a part of said wire

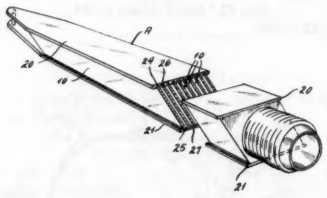
cylinder and separating from contact with said wire cylinder at said lower section, an endless felt encircling said endless wire screen at said part of said wire cylinder so that said endless wire screen and said felt form a sheet forming zone therebetween, said wire screen and felt moving at the same running speed as said wire cylinder, tension means for contacting said wire screen with said wire cylinder under pressure, means for guiding said felt so that part of said wire cylinder is encircled with said felt and said felt is urged toward said wire screen under pressure, a flow box disposed above said wire screen and provided with a bottom aperture to deposit stock upon said wire screen, said flow box being located above said wire screen at a predetermined distance from an ingoing nip of said sheet forming zone, said wire screen being carried along a horizontal passage between a position below said flow box and said ingoing nip, a couch roller disposed below said wire cylinder, said couch roller being urged toward said wire cylinder to press said felt and wire screen against said wire cylinder, first and second roll means spaced from said couch roller, said screen extending from said lower section of said wire cylinder around said first roll means whereby said first roll means determines the location of separation of said screen from said wire cylinder, said felt extending from said sheet forming zone at said couch roller to said second roll means whereby said second roll means determines a location of separation of said felt and screen at said couch roller, a suction slider located adjacent said lower section of said wire cylinder between a surface of said wire cylinder and said wire screen adjacent said location of separation of said screen from said wire/cylinder, said suction slider having a suction aperture facing in the tangential direction of said wire cylinder at said location of separation of said screen from said wire cylinder to draw water from within said wire cylinder, means connected to said suction slider for applying suction thereto, and a suction box disposed adjacent said couch roller downstream of said location of separation of said felt from said screen, said suction box located below said felt and below said wire screen closely downstream of said suction slider, said suction box provided with a suction aperture closely facing the underside of said felt for holding paper formed between said felt and wire screen to said felt at said location of separation of said felt from said screen.

3,923,596

FUEL ASSEMBLIES FOR NUCLEAR REACTORS

Byron H. Leonard, Jr., 62 Linda Vista, Atherton, Calif. 94025

Filed Jan. 11, 1960, Ser. No. 1,676
Int. Cl. G21c *3/36*
U.S. Cl. 176—75 **3 Claims**



1. A fuel assembly for a nuclear reactor comprising, a plurality of elongated plate-like fuel bearing elements, of the same length and width, paired longer than they are wide and assembly spacer members having means defining opposed spaced notches for receiving the side edges of said elongated plate-like fuel bearing elements, and means for securing said plate-like fuel bearing elements to said paired assembly spacer members with the side edges of said plate-like elements engaged in opposite notches in said paired assembly spacer elements so as to secure said fuel bearing elements in side by side spaced relation in a staggered arrangement transversely so as to conform to a diamond shaped profile in which opposite sides are parallel and opposite angles are substantially 60° and substantially 120 degrees.

3,923,597

MERCURY CONCENTRATION BY THE USE OF MICROORGANISMS

Ananda M. Chakrabarty, Latham; Denise A. Friello, Schenectady, and Joan R. Mylroie, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,693
Int. Cl.² C12B *1/00*
U.S. Cl. 195—2 **6 Claims**

1. A process for significantly reducing the mercury content of an aqueous liquid containing mercury contamination comprising the steps of:

a. bringing said aqueous liquid into contact with a Pseudomonas organism genetically engineered to contain transmissible MER plasmid, said MER plasmid having the property of generating mercury-binding protein, the concentration of said organism in contact with said liquid being at least about 10^9 MER-containing cells per ml of said liquid,

b. maintaining said liquid-organism contact for at least about 10 minutes whereby mercury becomes protein bound by said MER-containing cells of said organism and

c. recovering the resulting liquid from the resulting organism.

3,923,598

PROCESS FOR PRODUCING CYCLODEXTRINS

Koki Horikoshi, Fujimi, Japan, assignor to Rikagaku Kenkyusho, Japan

Filed Mar. 18, 1974, Ser. No. 452,139
Claims priority, application Japan, Mar. 19, 1973, 48-31680; Dec. 6, 1973, 48-136664
Int. Cl.² C12D *13/02*
U.S. Cl. 195—31 R **4 Claims**

1. A process for producing cyclodextrin which comprises subjecting starch to the activty of a cyclodextrin glycosyltransferase produced by cultivation of a microorganism selected from the group consisting of Bacillus sp. No. 38-2 (ATCC 21783), Bacillus sp. No. 135 (ATCC 21595), Bacillus sp. No. 169 (ATCC 21594), Bacillus sp. No. 13 (ATCC 31006) and Bacillus sp. No. 17-1 (ATCC 31007), at a pH of 6.0 – 10.5 and recovering said cyclodextrin.

3,923,599

PROCESS FOR PREPARING PLANT ENZYME PREPARATIONS OF LOW GERM CONTENT

Hans Hess, Binningen; Guenther Mueller, Arlesheim, and Xaver Buehlmann, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 26, 1972, Ser. No. 266,195
Claims priority, application Switzerland, July 5, 1971, 9831/71
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C12D *11/00*; **C07G** *7/022*
U.S. Cl. 195—66 R **13 Claims**

1. A process for the manufacture of a plant enzyme preparation of papain, ficin or bromelin of low germ content, which in comparison to unpurified corresponding enzyme displays a practically unchanged enzyme activity, wherein said contaminated plant enzyme preparation is processed with a stabilized emulsion of a halogenated hydrocarbon with a boiling point between 15°C and 100°C, with or without a cellulose derivative, to form a plastic mass which is dried in known manner.

5. A Process according to claim 5, wherein a halogenated hydrocarbon with a boiling point between 30°C and 60°C.

6. A process according to claim 5 wherein methylene chloride or chloroform is used.

8. A process according to claim 5, wherein the emulsion contains a cellulose derivative in order to stabilize or thicken it.

3,923,600
PURIFICATION OF MICROORGANISM CELLS LYTIC ENZYME

Yoshio Yoshimura, Nishinomiya; Kanae Yokogawa, Nara, and Shinzo Nishimura, Osaka, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jan. 2, 1973, Ser. No. 320,193

Claims priority, application Japan, Oct. 24, 1972, 47-106538

Int. Cl.² C07G *7/028*; C12D *13/10*

U.S. Cl. 195—66 R **4 Claims**

1. A method for purifying a microorganism cells lytic enzyme contaminated with proteases obtained by cultivating a microorganism of the genus Streptomyces, which comprises by regulating the pH value of an aqueous solution containing the microorganism cells lytic enzyme and proteases within a range of about 3.0 to 1.0 with an acid and filtering off the resulting precipitates of proteases.

3,923,601
PROCESS FOR THE MANUFACTURE OF CEPHALOSPHORIN C

Hans-Joerg Treichler, Buus, and Jakob Nuesch, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 106,420, Jan. 14, 1971, Pat. No. 3,776,815. This application July 16, 1973, Ser. No. 379,531

Int. Cl.² C12K *1/02*

U.S. Cl. 195—78 **2 Claims**

1. A colony of a methionine-auxotropic mutant of a Cephalosporin C-producing strain of the genera Emericellopsis-Cephalosporium.

3,923,602
COMPOSITION OF MATTER AND PROCESS

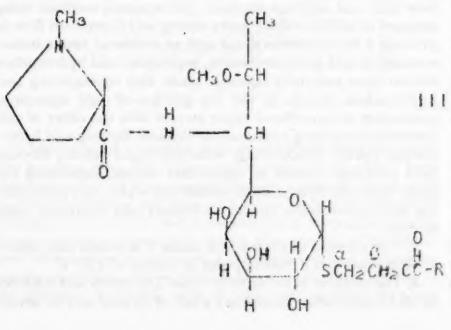
Alexander D. Argoudelis, Portage; John H. Coats, and LeRoy E. Johnson, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 409,402, Oct. 25, 1973, which is a continuation-in-part of Ser. No. 370,351, June 15, 1973. This application Jan. 31, 1975, Ser. No. 545,734

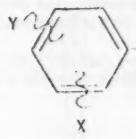
Int. Cl.² C12D *9/00*

U.S. Cl. 195—80 R **22 Claims**

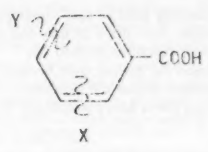
1. A process for preparing desalicetin β-acylates of the formula



wherein R is selected from the group consisting of alkyl or alkylene of up to 12 carbon atoms; substituted alkyl or alkylene wherein the alkyl or alkylene is of up to 12 carbon atoms and the substitution group is selected from the group consisting of —OH, OR′, —HN_2, —NHR′, —NO_2, —SO_3H, —SO_2NH_2, —COOH, Cl, Br, I, F, —SH, and SR′, and



wherein X and Y are selected from the group consisting of H, R′, —OH, —OCH_3, OR′, NH_2, NHR′, NO, NO_2, —CHO, —CN, —COOH, —CH_2OH, —SO_3H, —SO_2NH_2, Cl, F, Br, I, —SH, and —SR′, wherein R′ is alkyl of not more than 8 carbon atoms, and with the understanding that X and Y can be the same or different, which comprises the addition of an effective amount, ranging from about 0.5 gms. to about 5 gms. per liter of fermentation medium, of a carboxylic acid selected from the group consisting of saturated and unsaturated, substituted and unsubstituted aliphatic acids of from 2 to 12 carbon atoms, inclusive; substitutions of the aliphatic acids can be —OH, OR′, —NH_2, —NHR′, —NO_2, —SO_3H, —COOH, Cl, F, Br, I, —SH, SR′, monosubstituted and disubstituted aromatic acids of the general formula



wherein X and Y are selected from the group consisting of R′, —OH, —OCH_3, OR′, NH_2, NHR′, NO, NO_2, —CHO, —CN, —COOH, —CH_2OH, —SO_3H, —SO_2NH_2, Cl, F, Br, I, —SH, and —SR′, wherein R′ is alkyl of not more than 8 carbon atoms, to a *Streptomyces caelestis* celesticetin fermentation being conducted in an aqueous nutrient medium under aerobic conditions.

3,923,603
DISCRETE PLASMID CONSTRUCTION FROM CHROMOSOMAL GENES IN PSEUDOMONAS

Ananda M. Chakrabarty, Latham, and Denise A. Friello, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,691

Int. Cl.² C12B *1/00*

U.S. Cl. 195—78 **5 Claims**

1. A process for transferring chromosomal genes specifying a hydrocarbon degradative pathway for a given substrate from a first strain of Pseudomonas and imparting said chromosomal genes as part of a plasmid aggregate into a second strain of Pseudomonas which does not contain said chromosomal genes comprising the steps of:

a. introducing factor K, a transfer plasmid, into at least one organism of said first strain of Pseudomonas which mobilizes said chromosomal genes and forms a plasmid aggregate therewith,

b. admixing the resulting first strain of Pseudomonas with said second strain of Pseudomonas transferring said plasmid aggregate by conjugation,

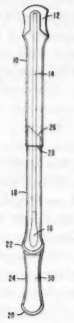
c. placing the mixture on minimal plates containing said given substrate as the sole source of carbon and

d. purifying the resulting conjugatants.

3,923,604
TUBULAR ARTICLES

Frank Monaghan, Glendale, Calif., assignor to M & H Plastics Inc., Burbank, Calif.

Filed Apr. 26, 1971, Ser. No. 137,148
Int. Cl.[2] C12K 1/10
U.S. Cl. 195—139 3 Claims

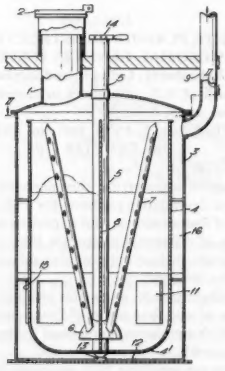


1. A disposable culture tube device comprising:
a. An upper plastic tube open at one end and sealed at the other;
b. The seal being shaped so as to frictionally hold the end of an swab;
c. a swab frictionally held in said upper plastic tube,
d. A lower plastic tube open at one end and sealed at the other, having a chamber formed by,
e. Welding closed the plastic tube between its ends;
f. A liquid medium within the chamber;
g. The upper and lower tubes adapted to fit tightly together.

3,923,605
ARRANGEMENT FOR BIOLOGICAL DECOMPOSITION OF EXCREMENTS AND KITCHEN REFUSE AND THE LIKE

Tore Gedde, 3020 Krokstadelva, Norway

Filed Oct. 18, 1973, Ser. No. 407,676
Int. Cl.[2] C02C 1/02
U.S. Cl. 195—142 6 Claims

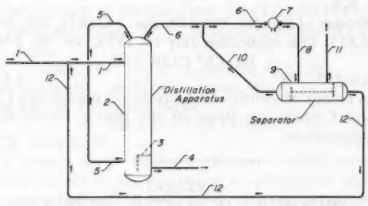


1. Apparatus for the biological decomposition of wastes comprising a first stationary container, a second container disposed within said first container to be turnable about a generally vertical axis, means for admitting air into said second container, at least one generally upright partition in said second container dividing said second container into a plurality of angularly spaced compartments, an inlet for waste material, said inlet being offset from a vertical axis about which said second container is turnable whereby a selected one of the compartments of said second container can be brought into register with said inlet, each compartment of said second container having a closable outlet and said first container having a closable outlet with which, by rotation of said second container the outlet of a selected one of the outlets of said compartments can be brought into register whereby material in said compartment of which the outlet registers with the outlet of said first container can be removed through said outlets.

3,923,606
PREVENTION OF CORROSION

Rudolf H. Hausler, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 26, 1973, Ser. No. 336,129
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B01D 3/34; C23F 14/00
U.S. Cl. 203—7 7 Claims



1. A method for the prevention of corrosion in a distillation apparatus provided with heat exchange and separation means used to strip gases from an aqueous medium consisting essentially of water containing entrained corrosion-producing gases which comprises the simultaneous circulation of two inhibitor-containing hydrocarbon streams, one of said streams entering the top portion of said apparatus, contacting the structural elements of said apparatus while in concurrent, downward flow with said aqueous medium, said aqueous medium being stripped of said entrained gases during said downward flow to produce a lean aqueous phase and an overhead vapor stream containing said gases and water, separating said hydrocarbon stream from said lean aqueous phase and recirculating said hydrocarbon stream to the top portion of said apparatus, contacting said overhead vapor stream with the other of said inhibitor-containing hydrocarbon streams, flowing said hydrocarbon stream concurrently with said vapor stream through heat exchange means to separation means, separating the gases from said hydrocarbon stream and water, and recirculating said hydrocarbon stream to contact said overhead vapor stream.

2. The method as set forth in claim 1 in which said hydrocarbon possesses a boiling point in excess of 250° C.

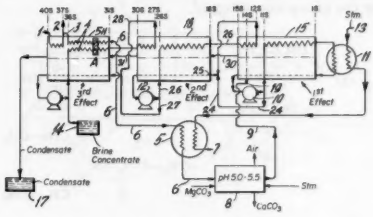
4. The method as set forth in claim 1 in which said inhibitor in said hydrocarbon comprises a salt of an acid and an amine.

3,923,607

PROCESS FOR PRETREATING SEA WATER BY PREHEATING SAME IN THE PREPARATION OF BRINE AND FRESH WATER

Hisanobu Tabata, and Norimasa Tabata, both of No. 968, Nou, Ohkoshi, Sakaide, Kagawa, Japan

Filed July 9, 1973, Ser. No. 377,292
Claims priority, application Japan, Aug. 10, 1972, 47-80165
Int. Cl.[2] B01D 3/02, 3/34; C23F 11/00; B01D 3/00
U.S. Cl. 203—7 1 Claim



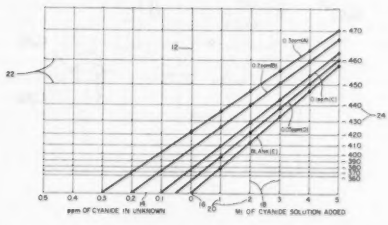
1. In a method for preparing brine and fresh water from sea water by heating the sea water in a multiple effect multi-stage flash evaporator, wherein the sea water first enters the final heat rejection stages of the flash evaporator and is passed in indirect heat exchange with vapor from the flashing sea water in said heat rejection stages to condense said vapor and preheat the sea water, the sea water being thereafter treated with magnesium carbonate to remove calcium therefrom and deaerated at a pH of 5.0 to 5.5, the sea water thereafter being introduced to the terminal flash stage of the first effect of the evaporator to be further flash evaporated, the improvement wherein the entering sea water is additionally preheated to about 50° to 65°C in a separate preheating stage prior to being subjected to the calcium removal and deaeration steps whereby after deaeration, the temperature of the thus treated sea water is about the same as it is in said terminal flash stage.

3,923,608

METHOD OF DETECTING LOW LEVELS OF CYANIDE

Martin S. Frant, Newton, Mass.; James Ross, Richmond, Va., and John H. Riseman, Cambridge, Mass., assignors to Orion Research Incorporated, Cambridge, Mass.

Filed Aug. 10, 1972, Ser. No. 279,336
Int. Cl. G01n 27/46
U.S. Cl. 204—1 T 12 Claims



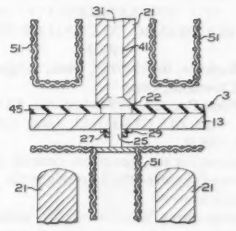
1. Method of determining with an electrode assembly sensitive to silver ions, the concentration particularly of low level concentrations of free cyanide ion in a sample liquid, said method comprising the steps of; measuring with an electrode sensitive to silver ions, in the presence of a dissociated soluble silver cyanide complex, before and after mixture of said complex with known volumes of a standard solution containing known quantities of free cyanide ion, the silver ion activity in the mixture; measuring with an electrode sensitive to silver ions, after mixture of said complex with said sample liquid, the silver ion activity of the latter mixture; and computing from said measurements the original concentration of free cyanide ions in said sample liquid.

3,923,609

METHOD OF JOINING SILICON METAL

Cletus N. Welch, Clinton, and Aleksandrs Martinsons, Wadsworth, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 19, 1973, Ser. No. 426,414
Int. Cl.[2] C25D 1/02; B23K 31/02
U.S. Cl. 204—16 8 Claims



1. A method of joining an electroconductive silicon metal work piece comprising silicon and sufficient dopant to provide an electroconductivity greater than 10^2 (ohm-centimeters)$^{-1}$ to a second metallic work piece which method comprises:

a. electroplating a surface of an adherent material chosen from the group consisting of nickel, copper, tin, aluminum, zinc, silver, palladium, platinum, and gold on the surface of the silicon work piece to be joined to the second metallic work piece;

b. providing a pool of an electrically conductive epoxy resin bonding material in contact with the electroplated surface of the adherent material on the surface of the silicon work piece and with the second metallic work piece; and

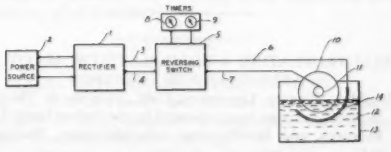
c. solidifying the bonding material whereby to join the silicon work piece and the second metallic work piece.

3,923,610

METHOD OF COPPER PLATING GRAVURE CYLINDERS

Michael J. Bergin, Bayside, N.Y., and Richard Flaig, Danbury, Conn., assignors to Intaglio Service Corporation, Stamford, Conn.

Filed Aug. 27, 1974, Ser. No. 500,861
Int. Cl.[2] C25D 5/18, 7/04; B41N 3/00
U.S. Cl. 204—32 R 7 Claims



1. A method of reconditioning used gravure cylinders consisting of a cylindrical substrate having a layer of copper deposited thereon and having an ink carrying intaglio image consisting of a multiplicity of cells etched into the surface of said layer of copper, which said method comprises the steps of:

a. exposing the surface of said cylinder to an electrolyte,

b. passing direct current through said electrolyte and cylinder,

c. removing copper from said layer during a first stage of operation in which the direction of flow of direct current through said electrolyte is reversed repeatedly so that forward flow of current through said electrolyte is alternated with reverse flow and in which the duration of reverse flow of current exceeds the duration of forward flow, and

d. applying copper to said layer during a second stage of operation in which the direction of flow of direct current through said electrolyte is reversed repeatedly so that forward flow of current through said electrolyte is alternated with reverse flow and in which the duration of forward flow of current exceeds the duration of reverse flow.

3,923,611
DIRECT-ON CERAMIC COATING OF CARBON-RICH IRON

Clifford G. Ruderer, Brecksville, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Dec. 23, 1974, Ser. No. 535,441
Int. Cl.² C25D *5/12, 5/48, 5/50*
U.S. Cl. 204—35 R **22 Claims**

1. In a process for the direct-on, ceramic coating of a carbon-rich, iron workpiece, the improvements prior to depositing the ceramic coat of:

a. electrodepositing a substantially continuous layer of substantially pure iron onto said carbon-rich iron workpiece from a liquid medium containing iron ions while using the workpiece as a cathode, and

b. then reversing the polarity of the electrodeposit to remove some of the deposited iron and produce an exposed, fissured surface in said substantially continuous layer.

14. The process for preparing an iron workpiece containing at least 0.03% by weight of carbon for a direct-on ceramic coating without the use of an intermediate ceramic ground coat, comprising:

a. electrodepositing onto said workpiece a dense, non-porous layer of substantially pure iron in an amount of about 2 grams per square foot to about 12 grams per square foot from an aqueous electroplating bath containing iron ions, while using the workpiece as a cathode,

b. electrodepositing over said dense layer a porous layer of substantially pure iron in an amount of about 2 grams per square foot to about 12 grams per square foot from an aqueous electroplating bath containing iron ions, while using the workpiece as a cathode,

c. reversing the polarity of the electrodeposit to remove some of the deposited iron in an amount of about 1 gram per square foot to about 10 grams per square foot to produce an exposed fissured, textured surface in the continuous layer, and

d. then forming a ceramic coat on said fissured, textured surface.

3,923,612
ELECTROPLATING A GOLD-PLATINUM ALLOY AND ELECTROLYTE THEREFOR

Harold J. Wiesner, Livermore, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 25, 1974, Ser. No. 445,740
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C25D *3/62, 3/56*
U.S. Cl. 204—43 G **6 Claims**

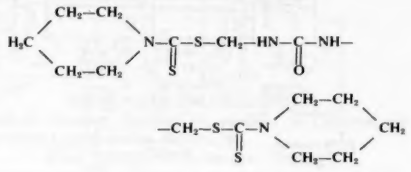
1. An aqueous electrolyte solution for the electrodeposition of gold-platinum alloys comprising an alkali metal hexahydroxyplatinate and an alkali metal aurate and wherein the pH of the solution is above substantially 11.0.

3,923,613
ACIDIC GALVANIC COPPER BATH

Waldemar Immel, Solingen, Germany, assignor to W. Kampschulte & Cie., Solingen, Germany

Continuation of Ser. No. 334,296, Feb. 21, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 510,025
Claims priority, application Germany, Feb. 22, 1972, 2208198
Int. Cl.² C25D *3/38*
U.S. Cl. 204—52 R **3 Claims**

1. In an acidic galvanic copper bath the improvement comprising providing the bath with a substituted urea selected from the group consisting of

1.


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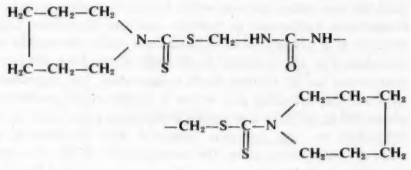

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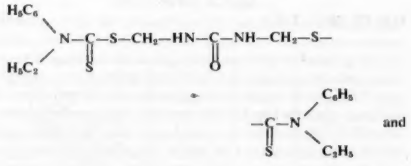

and

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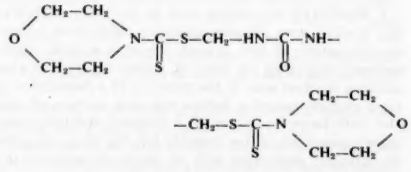
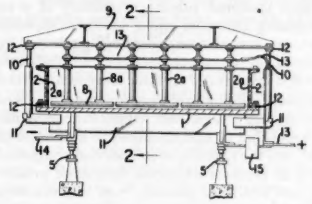


3,923,614

METHOD OF CONVERTING MERCURY CATHODE CHLOR-ALKALI ELECTROLYSIS CELLS INTO DIAPHRAGM CELLS AND CELLS PRODUCED THEREBY

Vittorio De Nora, Nassau, Bahamas, and Oronzio De Nora, Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Apr. 1, 1974, Ser. No. 456,646
Int. Cl.[2] C25B *1/36, 1/26, 9/00*
U.S. Cl. 204—99 21 Claims



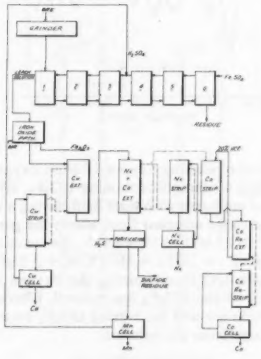
4. The cell of claim 1, in which the length to width ratio is about 17:1.

3,923,615

WINNING OF METAL VALUES FROM ORE UTILIZING RECYCLED ACID LEACHING AGENT

William S. Kane, Wicomic, and Paul H. Cardwell, Zanoni, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Continuation-in-part of Ser. No. 272,226, July 17, 1972, Pat. No. 3,795,596, which is a continuation of Ser. No. 40,585, May 26, 1970, abandoned, Continuation-in-part of Ser. No. 247,554, April 26, 1972. This application July 16, 1973, Ser. No. 379,213
Int. Cl. C25c *1/10*
U.S. Cl. 204—105 M 29 Claims



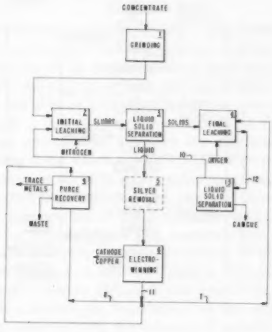
1. A process for selectively removing metal values from an ocean floor nodule ore, the ore comprising a primary proportion of manganese and iron and secondary proportions of nickel, copper and cobalt, the process comprising the steps of (*a*) leaching the ore with an aqueous solution of a mineral acid which is capable of reacting with the ore to preferentially form water-soluble salts of nickel and copper, to obtain an initial aqueous leach solution comprising dissolved iron, copper and nickel salts derived from the respective metal values present in the ore and a solid leached ore, and (*b*) releaching the solid leached ore under reducing conditions, with an aqueous solution of a reducing reagent which is capable of reducing tetravalent manganese to divalent manganese and of forming water-soluble salts of cobalt and divalent manganese, so as to form a final aqueous leach solution comprising dissolved manganese and cobalt salts, whereby the copper, cobalt, nickel and manganese values in the ore are removed therefrom in the form of dissolved salts.

3,923,616

RECOVERY OF METAL VALUES FROM ORES

Erdem M. Atadan, and Charles E. Coffey, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 1, 1973, Ser. No. 402,488
Int. Cl.[2] C25C *1/12;* C01G *3/04*
U.S. Cl. 204—107 20 Claims



7. A process for recovering metal values from copper and iron containing sulfide minerals which comprises (a) contacting said minerals in at least two stages with a leach solution at a pH in the range of about 2.4–6 comprising copper chlorides in the initial stage and iron chlorides in the final stage whereby the metal values in said minerals are partially leached in the initial stage and the cupric ion is reduced to the cuprous ion and substantially leached in the final stage in intimate contact with molecular oxygen-containing gas while precipitating ferric hydroxide and wherein sufficient chloride ion is provided in both of said stages to maintain the desired metal values in solution, (b) separating the liquids and solids from the initial stage and directing said solids to said final stage, (c) electrowinning a portion of the copper values in the liquid from step (b), and (d) directing the liquid from step (c) to the final stage of leaching, said leaching being conducted at a temperature of at least 80°C.

3,923,617

ELECTROLYTIC RECOVERY OF ZINC

Thomas M. Morris, Tucson, and Edward A. Bilson, Inspiration, both of Ariz., assignors to Inspiration Consolidated Copper Company, Morristown, N.J.

Filed Aug. 15, 1974, Ser. No. 497,669
Int. Cl.[2] C25C *1/16*
U.S. Cl. 204—119 15 Claims

1. The method of recovering zinc from iron-bearing zinc sulfide concentrates which comprises the steps of:

a. leaching the concentrates with an aqueous sulfuric acid solution containing hexavalent chromium ions;

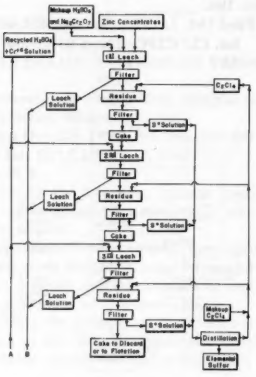
b. separating the leach solution depleted in acid at a pH above 0.6 and containing zinc, trivalent iron and trivalent chromium ions from the undissolved residue,

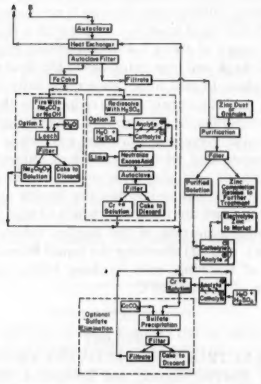
c. hydrolyzing the separated leach solution under pressure at a temperature near or above the boiling point of the solution to form a basic ferric sulfate salt precipitate,

d. separating said precipitate from the residual solution,

e. purifying the residual solution by treatment thereof with finely divided metallic zinc,

f. subjecting the purified solution to a first bifluid electrolysis to deposit metallic zinc from the catholyte and to regenerate sulfuric acid and partially reoxidize trivalent





chromium ions to hexavalent chromium ions in the anolyte,

g. subjecting anolyte from said first bifluid electrolysis to a second bifluid electrolysis to oxidize substantially all remaining trivalent chromium ions to hexavalent chromium ions in the anolyte,

h. and recycling anolyte from said second bifluid electrolysis to leach a further quantity of said zinc sulfide concentrates.

3,923,618

METHOD FOR PRODUCING HYDRAZINE

George C. Pedersen, 155 Hillside Drive, Orchard Park, N.Y. 14127

Continuation-in-part of Ser. No. 348,536, April 6, 1973. This application June 7, 1974, Ser. No. 477,439. The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—157.1 H 11 Claims

1. A method for producing enhanced yields of hydrazine, the steps which comprise placing a quantity of a reaction mixture comprising ammonia and a second component in a reaction zone; said second component being selected from the group consisting of a monohaloamine, a dihaloamine, a trihaloamine and mixtures of all three ammonia derivatives of a single halogen; exposing said reaction zone to a source of radiation energy under time and temperature conditions effecting decomposition of said ammonia to hydrazine product and H radical, and the reaction of said second component with said H radical to produce additional hydrazine product; and withdrawing said hydrazine product from said reaction zone.

3,923,619

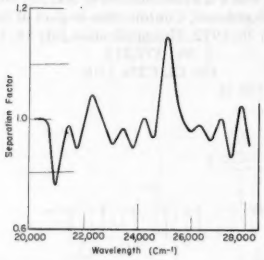
O^{18} ENRICHMENT PROCESS IN UO_2F_2 UTILIZING LASER LIGHT

Gerald L. DePoorter, and Cheryl K. Rofer-DePoorter, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 16, 1974, Ser. No. 506,479

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—157.1 R 6 Claims



1. A method of separating oxygen-16 from oxygen-18 comprising irradiating a solution containing UO_2F_2, HF, H_2O and a large excess of methanol with laser light having a wavelength within a limited range selected from within the general range of 22,250 cm^{-1} to 27,600 cm^{-1}, whereby the reaction $2\ UO_2F_2 + CH_3OH + 4HF \rightarrow 2UF_4 + HCOOH + 3\ H_2O$ proceeds preferntially with UO_2F_2 containing the oxygen 16 isotope, until about 10% of the UO_2F_2 has reacted, filtering product UF_4 from the solution and recovering UO_2F_2 enriched in the oxygen-18 isotope from the solution.

3,923,620

PREPARATION OF ALIPHATIC PHOSPHATES

Ingenuin Hechenbleikner, West Cornwall, and William Palmer Enlow, Falls Village, both of Conn., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 20, 1974, Ser. No. 507,632

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 R 7 Claims

1. A process for preparing aliphatic phosphates comprising introducing oxygen into a mixture of a trialkenyl or trialkyl phosphite and a source of free radicals, at a temperature

below about 80°C and in the presence of light of wavelength of 2000–4000A.

3,923,621

PROCESS FOR IRRADIATING A MIXTURE OF VINYLIDENE FLUORIDE POLYMER AND A PROPARGYL-CONTAINING CROSSLINKING AGENT AND PRODUCT THEREOF

Naohiro Murayama; Takayuki Katto, and Takao Ichii, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Filed June 21, 1973, Ser. No. 372,421
Claims priority, application Japan, June 23, 1972, 47-62496
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—159.17 2 Claims

1. A composition comprising a crosslinked mixture of

a. a vinylidene fluoride polymer selected from the group consisting of a vinylidene fluoride homopolymer and a vinylidene fluoride copolymer comprising a mixture of more than 50 mole % of vinylidene fluoride and a comonomer copolymerizable therewith selected from the group consisting of tetrafluoroethylene, vinyl fluoride, trifluorochloroethylene and propylene hexafluoride, and b. a crosslinking agent, present in the range of approximately 0.05 to 20 parts per hundred of the vinylidene fluoride polymer, selected from the group consisting of tripropargyl cyanurate, dipropargylallyl cyanurate, diallylpropargyl cyanurate, tripropargyl isocynaurate, dipropargylallyl isocyanurate and diallylpropargyl isocyanurate,

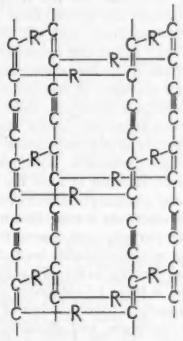
said composition having been crosslinked by irradiation with high energy radiation wherein the dosage of radiation is in the range of approximately 2–8 M rad.

3,923,622

CYCLICALLY-BOUND LADDER POLYMERS OF CYCLIC DIACETYLENE TETRAMERS

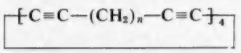
Ray H. Baughman, Morris Plains, and Kwok Chun Yee, Randolph, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 13, 1974, Ser. No. 497,027
Int. Cl.² C08F *2/36, 2/48, 138/00*
U.S. Cl. 204—159.22 8 Claims



R = $-(CH_2)_n-$

1. Solid cyclically-bound ladder homopolymers of cyclic tetramers of terminal diacetylenes having the formula



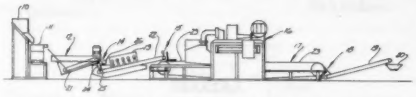
wherein n is an integer of from 3 to 10, being substantially free of unreacted diacetylene groups as indicated by substantial absence of Raman vibration at about 2255 cm^{-1}.

3,923,623

METHOD AND APPARATUS FOR USE IN CONJUNCTION WITH ELECTROPAINTING A LARGE NUMBER OF SMALL ARTICLES

Roy A. Brown, and Franklin H. Guzzetta, both of Monroe, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 354,938, April 27, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 494,988
Int. Cl.² C25D *13/06;* B65G *49/02;* B07B *4/02*
U.S. Cl. 204—181 25 Claims



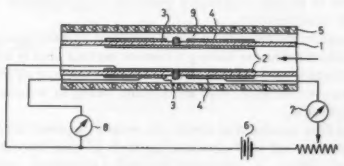
1. In a method for electropainting a large number of small articles and including a moving grid for moving the articles through and out of an electropainting bath and onto a conveyor belt for moving the articles through a water rinse station whereafter the articles are deposited on an oven belt to take them through a curing oven, that method of separating the articles from one another between the electropainting bath and the curing oven which comprises the steps of: effecting a first separation of the articles by subjecting them to a water blast as they fall from said grid onto said conveyor belt; effecting a second separation of the articles by subjecting them to an air blast as they fall from said conveyor belt towards said oven belt; and effecting a third separation of the articles by passing them through a louvered grid as they continue their fall from said conveyor belt onto said oven belt; by virtue of all of which a maximum distribution of the articles on said oven belt is achieved with a minimum of paired pieces.

3,923,624

APPARATUS FOR THE MEASURING AND SUPPLYING A CONTROLLED QUANTITY OF A GAS

Nicholaas Marinus Beekmans, and Leopold Heijne, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,472
Claims priority, application Netherlands, Mar. 28, 1973, 7304299
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 S 7 Claims



1. Apparatus for measuring and controlling the partial pressure of oxygen, comprising:

first and second axially aligned tubular conduit sections of a material capable of conducting electricity predominately by the transfer or migration of oxygen ions;

a third tubular conduit section aligned with and spacing said first and second tubular conduit sections and forming therewith a tubular conduit cell, said third tubular conduit section being of a material which is substantially not capable of conducting electricity by the transfer or migration of oxygen ions;

first and second electrode layers substantially covering the outside surface respectively of said first and second tubular sections;

a third electrode layer substantially covering the inside surface of said first, second and third tubular sections;

voltage measuring means electrically connected between said first and third electrode layers for measuring the difference between partial oxygen pressures inside and outside of said tubular conduit cell; and

means electrically connected between said second and third electrode layers for applying a voltage therebetween to cause oxygen to be transferred into or out of said tubular conduit cell.

3,923,625

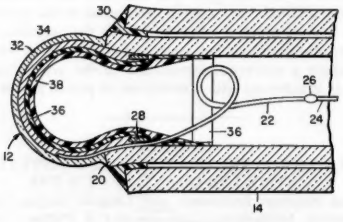
REINFORCED GLASS ELECTRODE STRUCTURE

David J. Fischer, Corning, N.Y.; Hans J. Kunz, and Thomas E. Norby, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 158,448, June 30, 1971, abandoned. This application May 10, 1974, Ser. No. 468,750

Int. Cl.² G01N 27/36

U.S. Cl. 204—195 G **21 Claims**



1. An electrode structure for measuring activity of an ionic species in an ion containing solution, said structure comprising, in combination:

a curved membrane of glass sensitive to said ionic species, said membrane having a convex surface that is adapted to contact said solution and a concave surface opposite said convex surface, said membrane being in a state of compression,

thin film conductive electrode means disposed on at least a portion of said concave surface of said membrane for providing a strongly bonded electrical connection thereto,

a conductive lead wire,

connecting means for providing an electrical connection between said lead wire and said conductive electrode, and

a mass of non-conductive backing material strongly adherent to said conductive electrode means and to any portion of said concave surface of said membrane on which said conductive electrode is not disposed, the thermal coefficient of expansion of said backing material being substantially greater than that of said glass membrane, said backing material reinforcing said electrode structure as well as providing an insulating coating therefor.

3,923,626

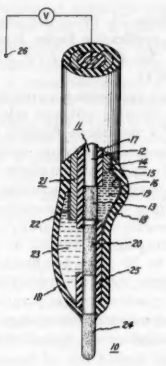
MINIATURE PROBE CONTAINING MULTIFUNCTIONAL ELECTROCHEMICAL SENSING ELECTRODES

Leonard W. Niedrach, and William H. Stoddard, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,794

Int. Cl.² G01N 27/30, 27/46

U.S. Cl. 204—195 R **7 Claims**



1. A miniature probe containing an oxygen sensor, a carbon dioxide sensor and a pH electrode which comprises a flexible, elongated electrode lead, the electrode lead comprising a base member, and an exterior surface of palladium on the base member, three separate and spaced apart electrochemically active regions of hydrided palladium with a surface of platinum black, palladium oxide and palladium oxide, respectively, adhering tightly to an in electrical contact with the metal surfaced base member of the electrode lead and insulated electrically from each other thereby forming an oxygen electrode, a hydrogen electrode and a hydrogen electrode, respectively, a reference electrode for the oxygen electrode surrounding at least partially and spaced from the metal surfaced base member of the electrode lead, the reference electrode containing a metal lead and an electrochemically active region of silver, a layer of electrical insulation disposed between the metal surfaced base member of the electrode lead and the metal lead of the reference electrode, and electrolyte contacting both the electrochemically active regions of hydrided palladium with a surface of platinum black, and silver, and an outer sheath of oxygen permeable, ion-impermeable diffusion barrier material encapsulating at least the electrochemically active regions and the electrolyte thereby providing an oxygen sensor; a reference electrode for the first hydrogen electrode surrounding at least partially and spaced from the metal surfaced base member of the electrode lead, the reference electrode containing an electrochemically active region of silver and a silver halide, a layer of electrical insulation disposed between the metal surface base member of the electrode lead and the reference electrode, and electrolyte contacting both the electrochemically active regions of palladium oxide and silver and silver halide, and an outer sheath of carbon dioxide permeable, ion-impermeable diffustion barrier material encapsulating at least the electrochemically active regions and the electrolyte thereby providing a carbon dioxide sensor; and a pH electrode comprising a separate portion of the metal surfaced base member of the electrode lead and an electrochemically active region of palladium oxide adhering tightly to and in electrical contact with the metal surfaced base member and exposed exteriorly of the outer sheaths.

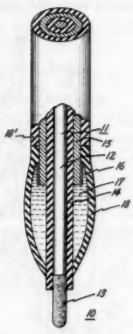
5. An analytical apparatus comprising the miniature probe of claim 1 and a separate reference electrode connected electrically to the pH electrode of the probe.

3,923,627

MINIATURE PROBE CONTAINING MULTIFUNCTIONAL ELECTROCHEMICAL SENSING ELECTRODES

Leonard W. Niedrach, and William H. Stoddard, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,797
Int. Cl.² G01N 27/30, 27/46
U.S. Cl. 204—195 M 12 Claims



1. A miniature probe containing a first specific ion electrode and a second specific ion electrode which comprises a flexible, elongated electrode lead, the electrode lead comprising a metallic base member, an electrochemically active region showing response to the first specific ion adhering tightly to and in electrical contact with one end portion of the metallic base member, and electrical insulation surrounding the metallic base member and a portion of the electrochemically active region and thereby forming a first specific ion electrode exposed at the end of the metallic base member beyond the electrical insulation; a second metallic electrode lead surrounding at least partially and spaced from the metallic base member of the first electrode lead by the electrical insulation thereon, a second electrochemically active region showing response to the second specific ion on the second electrode lead at one end thereof, electrical insulation surrounding the second metallic electrode lead, an electrolyte contacting the second electrochemically active region, and an outer sheath of a membrane permeable to the second specific ions encapsulating the second electrochemically active region and the electrolyte and forming a tight joint with the electrical insulations thereby forming a second specific ion electrode, but not encapsulating the exposed electrochemically active region of the first specific ion electrode.

3,923,628

DIAPHRAGM CELL CHLORINE PRODUCTION

Gerhard Gritzner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 361,743, May 18, 1973. This application Aug. 1, 1974, Ser. No. 493,812
Int. Cl.² C25B 9/00
U.S. Cl. 204—237 9 Claims

1. An electrolytic cell to produce chlorine and an alkali metal hydroxide comprising

an anode compartment adapted to contain an anolyte containing an alkali metal chloride;

a cathode compartment adapted to contain a catholyte containing an alkali metal hydroxide, said cathode compartment being spaced apart from said anode compartment by a diaphragm;

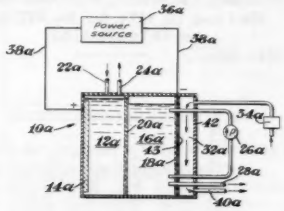
a diaphragm suited to pass at least alkali metal ions from said anode compartment to said cathode compartment, said diaphragm adapted to separate said anode compartment from said cathode compartment;

an anode positioned in said anode compartment;

a cathode positioned in said cathode compartment and spaced apart from said diaphragm, said cathode having a wall portion adapted to be in contact with the catholyte and another wall portion substantially simultaneously adapted to be in contact with an oxidizing gas;

an oxidizing gas compartment at least partially defined by a surface portion of said cathode and adapted to contain an oxidizing gas;

a means to circulate the catholyte at least within said cathode compartment in combination with said cathode compartment;



a means to control the moisture content of the oxidizing gas in combination with an oxidizing gas supply means and said cathode;

a means to remove the chlorine from said anode compartment;

a means to remove the alkali metal hydroxide from said cathode compartment; and

a means to supply electrical energy to said anode and said cathode.

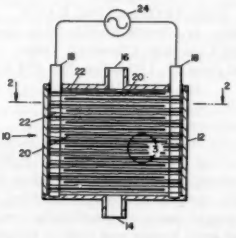
2. The electrolytic cell of claim 1 wherein said cathode is a foraminous body having at least the surface composed of a substantially inert material selected from the group consisting of Ru, Rh, Pd, Ag, Os, Ir, Pt and Au with a coating of a mixture of particulate inert metal and an organic component selected from the group consisting of polytetrafluoroethylene and fluorinated copolymers of hexafluoropropylene and tetrafluoropropylene.

3,923,629

ELECTROLYTIC CELL FOR INACTIVATION AND DESTRUCTION OF PATHOGENIC MATERIAL

Peter T. B. Shaffer, Grand Island, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,637
Int. Cl.² C02B 1/82; C02C 5/12
U.S. Cl. 204—260 6 Claims



1. An electrolytic cell for use in apparatus for inactivating and destroying fluid borne pathogenic material, said cell comprising: a tubular perforated core of electrically non-conduc-

tive material, a body surrounding said core and including at least two electrode layers of fluid permeable electrically conductive material separated by fluid permeable electrically insulative material, and two end caps of electrically conductive material secured to said core and holding said body therebetween, with one end cap making electrically conductive contact with said one layer and the other end cap making electrically conductive contact with said other layer.

3,923,630

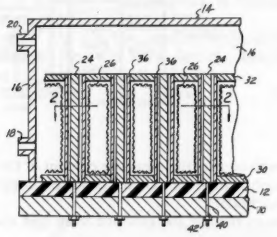
ELECTROLYTIC CELL INCLUDING DIAPHRAGM AND DIAPHRAGM-SUPPORT STRUCTURE

Shyam D. Argade, Woodhaven; Stephen M. Collins, Trenton, and James B. Armitage, Dearborn, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 16, 1974, Ser. No. 497,864

Int. Cl.² C25B *13/02*

U.S. Cl. 204—266 **8 Claims**



1. In a diaphragm cell for the production of chlorine and caustic from aqueous alkali metal chloride solutions having a plurality of anodes mounted at the bottom of said cell, cathodes between adjacent anodes and spaced between each cathode and anode a diaphragm which divides the cell into anolyte and catholyte compartments the improvement which comprises:

a diaphragm assembly composed of an upper diaphragm support, a lower diaphragm support and an endless band diaphragm extending from said upper support to said lower support, both said diaphragm supports being made of an electrically non-conductive polymeric composition, said lower support resting on or adjacent to the bottom of said cell and having openings therein which allow said anodes to extend through said lower support, said diaphragm being in connection with said upper and lower supports thereby defining a continuous barrier separating said anodes from said cathodes so that all of the flow of electrolyte from the anode to the cathode is through said diaphragm.

3,923,631

ELECTROPLATING RACK

Stephen P. Palisin, Jr., South Euclid, Ohio, assignor to The Empire Plating Company, Cleveland, Ohio

Filed June 17, 1974, Ser. No. 479,616

Int. Cl.² C25D *17/08*

U.S. Cl. 204—297 W **10 Claims**

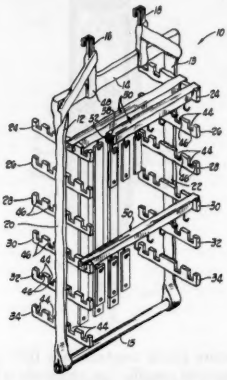
1. An electroplating rack comprising:

a. an electrically conductive framework including a pair of rack supporting hooks and a pair of rigidly connected uprights defining an elongated depending body;

b. each of said uprights centrally supporting a plurality of vertically spaced pairs of electrically conductive arms, each of said arms having end regions extending in opposite directions from its associated upright, the arms on one of said uprights being substantially horizontally paired with the arms on the other of said uprights such that each of the arm end regions carried on said one upright has a corresponding arm end region on said other upright;

c. a plurality of spaced, upwardly facing electrode surfaces defined on each of said end regions, the electrode surfaces on the arm end regions of said one upright having corresponding electrode surfaces on said corresponding arm end regions on said other upright, whereby a certain number of pairs of corresponding electrode surfaces are defined;

d. a plurality of electrically conductive elongated crossbars removably carried by said end regions;



e. each of said crossbars having a pair of downwardly facing electrode faces located near opposite ends of said crossbars and extending into electrically conductive engagement with a pair of said corresponding electrode surfaces, said crossbars being supported on said arms by virtue of said faces engaging said surfaces;

f. said crossbars each including a plurality of article support formations disposed at spaced intervals therealong; and,

g. an electrically insulative coating covering said bodies, said arms and said crossbars except within the regions of said surfaces, said faces, and said formations.

3,923,632

METHOD OF AND APPARATUS FOR DISINFECTING LIQUIDS BY ANODIC OXIDATION WITH A SILVER ANODE

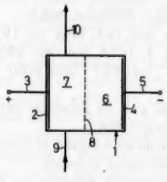
Volker Eibl, and August Reis, both of Munich, Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt am Main, Germany

Filed May 28, 1974, Ser. No. 473,389

Claims priority, application Germany, June 9, 1973, 2329628

Int. Cl.² C02B *1/82*

U.S. Cl. 204—301 **2 Claims**



1. Apparatus for purifying water contaminated with microorganisms which comprises:

a. a container enclosing a space adapted to hold said water;

b. a diaphragm dividing said space into an anode com-

partment and a cathode compartment, said diaphragm being permeable to anions only;

c. an anode of conductive material in said anode compartment, said conductive material consisting at least partly of metallic silver;

d. a cathode in said cathode compartment;

e. leads connected to said anode and to said cathode respectively for passing electric current through said liquid in said space between said cathode and said anode;

f. inlet means for admitting said contaminated water to said anode compartment; and

g. outlet means for withdrawing purified water from said space.

3,923,633

BITUMEN BLOWING

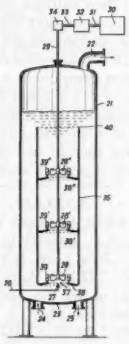
Hans Senolt; Heinrich Tomaschko, and Georg Palvik, all of Vienna, Austria, assignors to Osterreichische Mineralolverwaltung Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 78,036, Oct. 5, 1970, abandoned. This application Oct. 27, 1972, Ser. No. 301,328

Claims priority, application Austria, Oct. 3, 1969, 9331/69

Int. Cl.[2] C01G *27/00*

U.S. Cl. 208—6 **2 Claims**



1. A bitumen blowing method comprising blowing air into the region of the bottom of a body of bitumen having agitator means immersed therein, mechanically agitating the bitumen to disperse the air therein to form a mixture of air and bitumen, maintaining the air-bitumen dispersion by regulating the agitation responsive to the amount of air in said mixture, thus accelerating the agitation when the amount of air in the air and bitumen mixture increases and decelerating the agitation when the amount of air in the air and bitumen mixture decreases.

3,923,634

LIQUEFACTION OF COAL

Anthony J. Silvestri, Morrisville, Pa., and Paul A. Naro, Trenton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,916

Int. Cl.[2] C10G *1/06*

U.S. Cl. 208—10 **21 Claims**

1. A process for the liquefaction of coal comprising: reacting said coal with hydrogen or with a mixture of carbon monoxide and water, said reacting step being conducted at a temperature of at least 500°F and at a pressure of at least 1000 psig, in the presence of, as a catalyst, the naturally occurring underwater deposit known as manganese nodules; and recovering hydrocarbonaceous liquid.

3,923,635

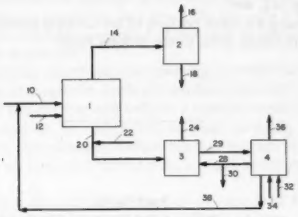
CATALYTIC UPGRADING OF HEAVY HYDROCARBONS

Bernard L. Schulman, Golden, Colo., and Clyde L. Aldridge, Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed June 17, 1974, Ser. No. 479,745

Int. Cl.[2] C10G *13/02, 37/04*

U.S. Cl. 208—50 **25 Claims**



1. A process for upgrading a heavy hydrocarbon feed containing sulfur contaminants, which comprises:

a. contacting said hydrocarbon feed with hydrogen and catalyst particles comprising a solid carbon-containing material and at least 2 weight percent of an alkali metal component (calculated as the metal based on the carbon-containing material) in a reaction zone maintained at an average temperature ranging from about 700° to about 1000°F. and at a hydrogen partial pressure of about 200 to 4000 psig to produce a vaporous product comprising normally liquid light hydrocarbons of reduced sulfur content, a carbonaceous residue, at least a portion of said carbonaceous residue depositing on said catalyst particles, and heavy liquid hydrocarbons;

b. removing said vaporous product overhead from said reaction zone;

c. removing from the bottom of said reaction zone a slurry of a portion of said heavy liquid hydrocarbons and a portion of said catalyst particles;

d. separating the catalyst particles from said slurry;

e. contacting at least a portion of the separated catalyst particles with steam in a gasification zone operated at a temperature ranging from about 1000° to about 1700°F., whereby at least a portion of the carbonaceous deposition is converted to a gas comprising hydrogen and carbon monoxide, and

f. recycling a portion of the catalyst particles from the gasification zone to said reaction zone of step (a).

20. A process for upgrading a heavy hydrocarbon feed containing sulfur contaminants, which comprises:

a. contacting said hydrocarbon feed with hydrogen and catalyst particles comprising a solid carbon-containing material and at least 2 weight percent of an alkali metal component (calculated as the metal based on the carbon-containing material) in an ebullient bed reaction zone maintained at an average temperature ranging from about 700° to about 1000°F. and at a hydrogen partial pressure of about 200 to about 4000 psig, to produce a vaporous product comprising normally liquid light hydrocarbons of reduced sulfur content, a carbonaceous residue, at least a portion of said carbonaceous residue depositing on said catalyst particles, and heavy liquid hydrocarbons;

b. removing said vaporous product overhead from said ebullient bed reaction zone;

c. removing from the bottom of said ebullient bed reaction zone a slurry of a portion of said heavy liquid hydrocarbons and a portion of said catalyst particles;

d. passing said catalyst-containing slurry to a fluid coking zone operated at a temperature of about 850° to about 1200°F. and at a pressure ranging from about 0 to about 150 psig to volatilize said heavy liquid hydrocarbons and thereby separate said catalyst particles from said slurry;

e. passing at least a portion of the catalyst particles resulting from step (d) to a gasification zone operated at a higher temperature than the operating temperature of said coking zone and contacting the same with steam and an oxygen-containing gas, whereby at least a portion of the carbonaceous deposition is converted to a gas comprising hydrogen and carbon monoxide;

f. recycling a portion of the catalyst particles from the gasification zone to the ebullient bed reaction zone of step (a), and

g. passing an other portion of the catalyst particles from the gasification zone to the coking zone.

3,923,636

PRODUCTION OF LUBRICATING OILS

Theodore C. Mead, Port Arthur; Norman R. Odell, Nederland, and John P. Shillinglaw, Jr., Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 3, 1974, Ser. No. 475,485

Int. Cl.² C10G *37/06, 41/00*

U.S. Cl. 208—58 **9 Claims**

1. A process for the production of lubricating oils which comprises hydrocracking heavy oil charge stock of which at least a portion boils above about 950°F., recovering a lubricating oil fraction from the hydrocracked product, fractionating the lubricating oil fraction into a light lube oil cut and a heavy lube oil cut, contacting the heavy lube oil cut with a solvent having an affinity for aromatics to produce an aromatic-poor raffinate and an aromatic-rich extract, combining the extract with said light lube oil cut and hydrogenating the resulting mixture.

JFH
WRH

3,923,637

HYDRODESULFURIZATION PROCESS WITH A PORTION OF THE FEED ADDED DOWNSTREAM

Robert D. Christman, Penn Hills Township; Joel D. McKinney, Indiana Township; Thomas C. Readal, McCandless Township, and Stephen J. Yanik, Hampton Township, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 29, 1973, Ser. No. 346,175

Int. Cl.² C10G *23/00*

U.S. Cl. 208—89 **5 Claims**

1. A hydrodesulfurization process comprising passing a relatively high boiling non-asphaltic petroleum feed oil having a volume average boiling point above 750°F. together with hydrogen downflow through a fixed bed of catalyst comprising Group VI and Group VIII metals on a non-cracking alumina support, adding to said bed at a downstream position which is at least 50 percent through said bed a relatively low boiling non-asphaltic petroleum feed oil having a volume average boiling point below 750°F. to form a blend of said high and low boiling oils, said position of addition and the proportion of said low boiling oil relative to said high boiling oil being such that said blend at said position of addition has a higher sulfur content than the sulfur content of the high boiling oil alone at said position of addition and so that said blend is desulfurized in said catalyst bed downstream from said position of addition to produce an effluent blend stream having a lower sulfur content than the sulfur content of the heavy oil alone at said position of addition.

3,923,638

TWO-CATALYST HYDROCRACKING PROCESS

Ralph J. Bertolacini, Chesterton; Louis C. Gutberlet, Crown Point, both of Ind., and Allen A. Kozinski, Urbana, Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 206,810, Dec. 10, 1971, which is a continuation-in-part of Ser. No. 814,997, April 10, 1969, abandoned. This application Dec. 20, 1973, Ser. No. 426,921

Int. Cl.² C10G *23/00*

U.S. Cl. 208—89 **21 Claims**

1. A process for hydrocracking a petroleum hydrocarbon feedstock which boils above about 350°F. and which contains nitrogen in an amount within the range of about 1 ppm to about 3,000 ppm, which process comprises contacting in a feed-preparation zone said feedstock in the presence of hydrogen and under hydrodenitrogenation conditions with a hydrodenitrogenation catalyst to obtain a denitrogenated effluent, and contacting at least a portion of said denitrogenated effluent in a hydrocracking zone in the presence of hydrogen and under hydrocracking conditions with a hydrocracking catalyst to obtain a hydrocracked effluent, said hydrodenitrogenation catalyst comprising as a hydrogenation component a member selected from the group consisting of (1) a metal from Group VIA of the Periodic Table of Elements and a metal from Group VIII of the Periodic Table of Elements, (2) their oxides, (3) their sulfides, and (4) mixtures thereof and a co-catalytic acidic support comprising an ultrastable, large-pore crystalline aluminosilicate material and a refractory inorganic oxide, and said hydrocracking catalyst comprising as a hydrogenation component a member selected from the group consisting of (1) a metal from Group VIA of the Periodic Table of Elements and a metal from Group VIII of the Periodic Table of Elements, (2) their oxides, (3) their sulfides, and mixtures thereof and an acidic support of an ultrastable, large-pore crystalline aluminosilicate material.

3,923,639

CONVERTING HYDROCARBONS WITH ZEOLITE ZSM-

Julius Ciric, Pitman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 722,149, April 18, 1968, which is a continuation-in-part of Ser. No. 509,568, Nov. 24, 1965, abandoned. This application May 17, 1972, Ser. No. 254,128

Int. Cl.² B01J *29/28*; **C01G** *11/04, 13/04*

U.S. Cl. 208—111 **9 Claims**

1. A process for converting a hydrocarbon charge which comprises contacting the same under hydrocarbon conversion conditions with a crystalline aluminosilicate zeolite catalyst having the X-ray powder diffraction pattern of Table 1 of the specification and having a composition in terms of mole ratios of oxides as follows:

$$0.9+0.2M_{2/n}OAl_2O_3: 3\text{–}20\ SiO_2: z\ H_2O$$

wherein M is a cation selected from the group consisting of alkylammonium, arylammonium, metals, ammonium and hydrogen, n is the valence of said cation and z is from 0 to 20, the hydrocarbon conversion conditions selected from those comprising a temperature of from 400°F to 1,100°F, a pressure of from 10 psig to 2,500 psig, and a liquid hourly space velocity of from 0.1 to 50.

APY/RJB/JAB

3,923,640

LOW PRESSURE HYDROCRACKING PROCESS

Carlyle G. Wight, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed June 6, 1973, Ser. No. 367,456

Int. Cl.² C10G *13/02*

U.S. Cl. 208—111 **20 Claims**

1. A process for the hydrocracking of a mineral oil feedstock containing at least about 15 volume-percent of aromatic hydrocarbons and at least about 25 volume-percent of components boiling above 500°F, which comprises:

1. contacting said feedstock plus added hydrogen with a catalyst comprising a Group VIII metal hydrogenating

component supported on a metal-cation-deficient Y zeolite base containing less than about 1 weight-percent sodium as Na_2O, said Y zeolite base having been stabilized by calcining an ammonium form thereof for a time and at a temperature sufficient to reduce the unit cell size thereof by at least about 0.2 percent, said contacting being carried out at a space velocity between about 0.75 and 10, a hydrogen pressure between about 300 and 1200 psi, and at a temperature correlated with space velocity to give a conversion per pass to products boiling below the initial boiling point of said feedstock of at least about 30 volume-percent but sufficiently low to maintain catalyst activity for the hereinafter recited run length of at least 30 days;

2. separating the effluent from step (1) into a desired low-boiling product fraction and an unconverted oil fraction comprising the highest-boiling components of said effluent; and
3. recycling to step (1) over a period of at least about 30 days a percentage of said unconverted oil which is at least equal to (P + 1,200)/24, where P is the hydrogen pressure in psi prevailing in step (1).

3,923,641

HYDROCRACKING NAPHTHAS USING ZEOLITE BETA

Roger A. Morrison, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 20, 1974, Ser. No. 444,221
Int. Cl.[2] C10G *13/04;* **B01J** *29/28*
U.S. Cl. 208—111 **6 Claims**

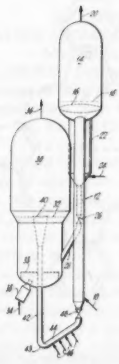
1. A process for hydrocracking a C_5^+ naphtha which comprises contacting said naphtha with a zeolite beta at a temperature of from about 400°F to about 550°F, at a space velocity of from about 0.1 to about 20 and at a hydrogen to hydrocarbon ratio of from about 1 to 1 to about 1 to 15, such that the final product has a i-C_4 to n-C_4 ratio of at least 7.

3,923,642

CATALYTIC HYDROCARBON CONVERSION PROCESS AND APPARATUS

Edward C. Luckenbach, Mountainside, and Arthur C. Worley, Morristown, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 18, 1974, Ser. No. 451,804
Int. Cl.[2] C10G *9/32*
U.S. Cl. 208—164 **9 Claims**



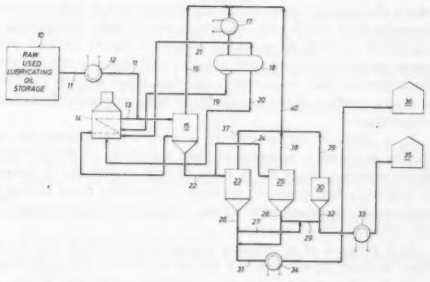
1. In a process for the catalytic conversion of hydrocarbons wherein a fluidized catalyst is circulated through a system comprising a catalyst regeneration vessel containing a fluidized bed of catalyst undergoing regeneration by passage of regeneration gas therethrough, an elongated hydrocarbon conversion zone and a gas-solids separation vessel, the improvement which comprises:
   a. overflowing catalyst from the upper level of the bed in said regeneration vessel into an open upper end of a standpipe which extends into said regeneration vessel;
   b. passing the catalyst downwardly through said standpipe;
   c. continuing the passage of the catalyst around the bend base of said standpipe and upwardly through a vertically inclined conduit connected at one end to the bend base of said standpipe;
   d. intermixing additional transporting gas with the catalyst passing through the vertically inclined conduit;
   e. passing the catalyst upwardly to a straight vertical conduit connected to the other end of said vertically inclined conduit, said straight vertical conduit extending into and having an open end terminating in a gas-solids separation vessel;
   f. forming a suspension of catalyst in vaporized hydrocarbons in said straight vertical conduit;
   g. passing said suspension from the open end of said straight vertical conduit to said gas-solids separation vessel to effect conversion of at least a portion of said vaporized hydrocarbons;
   h. separating said catalyst from said vaporized hydrocarbons;
   i. passing said separated catalyst into an open end of a stripping zone positioned in the lower portion of said gas-solids separation vessel, said open end of the stripping zone being separated from the open end of the straight vertical conduit;
   j. stripping hydrocarbons from the catalyst in said stripping zone, the flow of catalyst from steps (a) through (j) being effected without varying the size of any orifice through which the catalyst flows during process operation;
   k. passing at least a portion of said stripped catalyst from the bottom of said stripping zone to said regeneration vessel through a conduit connected at one end to said stripping zone and at the other end to said regeneration vessel, and
   l. controlling the flow of catalyst from said stripping zone to said regeneration vessel by varying the size of an orifice, when said process is in operation, through which said stripped catalyst flows from said stripping zone to said regeneration vessel.

3,923,643

REMOVAL OF LEAD AND OTHER SUSPENDED SOLIDS FROM USED HYDROCARBON LUBRICATING OIL

Robert W. Lewis, Houston; Thomas A. Rodgers, La Porte, and Charles F. Goeking, Jr., Pasadena, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed June 14, 1974, Ser. No. 479,343
Int. Cl.[2] C10M *11/00*
U.S. Cl. 208—179 **5 Claims**



1. A process for removing suspended lead and other dis-

persed solids from used hydrocarbon lubricating oil which comprises:

a. heating the used hydrocarbon lubricating oil under temperature and pressure conditions at which substantially all the water and volatile hydrocarbon materials boiling below about 500°F at atmospheric pressure will volatilize out of the used oil in a devolatilization zone to afford a used hydrocarbon lubricating oil substantially free of water and said volatile hydrocarbons, said water and volatile hydrocarbons being removed as a gaseous overhead,

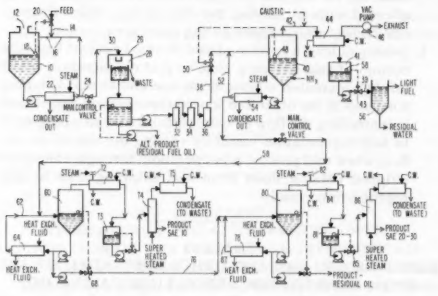
b. subjecting the used hydrocarbon lubricating oil substantially free of said water and volatile hydrocarbons to further heat treatment at a temperature between about 500° and 700°F for about 1 to 12 hours in a heat treatment zone thereby agglomerating the lead and other dispersed solids contained in the used oil and

c. separating the agglomerated solids from the used hydrocarbon lubricating oil.

3,923,644
PROCESS AND APPARATUS FOR RE-REFINING USED PETROLEUM PRODUCTS

George J. Hindman, Pottstown, Pa., assignor to Petrocon Corporation, Valley Forge, Pa.

Filed Oct. 11, 1974, Ser. No. 514,176
Int. Cl.² C10M *34/00*; C10G *33/00*; C10C *1/20*
U.S. Cl. 208—186 7 Claims



1. In a process of refining a used hydrocarbon oil wherein a used oil is distilled and filtered for re-use, the improvement comprising flash vaporizing said used oil in an evaporator in which the internal conditions are maintained at atmospheric pressure and 210°–240° F, and continuously separating a vaporized portion from an unvaporized liquid portion and continuously removing said unvaporized liquid portion from the bottom of said evaporator, and then mechanically filtering at least a portion of the unvaporized liquid removed from said evaporator.

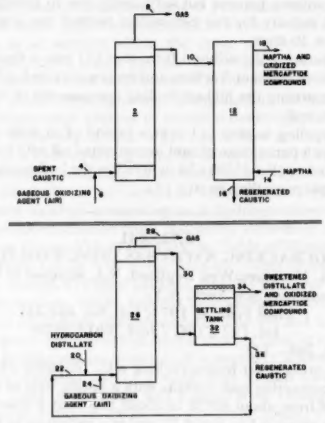
2. A process for re-refining a used hydrocarbon oil, as recited in claim 1, wherein at least a portion of unvaporized liquid removed from the bottom of said evaporator is passed at relatively low pressure through a vibratory filter having a horizontally disposed screen filter element having openings on the order of 40–45 microns.

3. A process of re-refining a used hydrocarbon oil, as recited in claim 2, wherein the filtrate from said vibratory filter is further filtered to remove remaining particles having a maximum dimension larger than 3 microns.

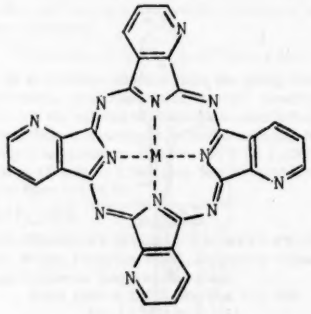
3,923,645
METHOD FOR OXIDIZING MERCAPTANS OCCURRING IN PETROLEUM REFINING STREAMS

Gilbert P. Anderson, Jr., Ashland, and Clifford Ward, Louisa, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sept. 7, 1973, Ser. No. 395,256
Int. Cl.² C10G *19/02*
U.S. Cl. 208—206 10 Claims



1. A method for oxidizing mercaptans occurring in petroleum refining streams and alkali mercaptide compounds resulting from contacting aqueous caustic solutions with petroleum refining streams containing mercaptans to their corresponding disulfide compounds comprising contacting said mercaptan and mercaptide compounds in an aqueous alkaline solution with a gaseous oxidizing agent in the presence of a catalyst comprising a metal complex of tetrapyridinoporphyrazine supported on a solid granular inert carrier and having the structural formula:



Where M is a metal selected from the group consisting of iron, manganese, chromium, magnesium, copper, nickel, zinc, titanium hafnium, thorium, tin, lead, columbium, tantalum, antimony, bismuth, molybdenum, palladium, platinum, silver, mercury, vanadium and cobalt.

3,923,646

HYDRODESULFURIZATION WITH A CATALYST FORMED FROM AN ALUMINA SOL CONTAINING ALPHA-ALUMINA MONOHYDRATE

Lee Hilfman, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 347,589, April 3, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,567

Int. Cl.² C01G *23/02*

U.S. Cl. 208—216 **13 Claims**

1. A process for desulfurizing a sulfur-containing petroleum hydrocarbon fraction which comprises passing said petroleum hydrocarbon fraction and hydrogen in contact with a catalytic composite at hydrodesulfurization reaction conditions, said catalytic composite comprising from about 5 to about 20 wt. % Group VIB metal or metal oxide and from about 0.1 to about 10 wt. % Group VIII metal or metal oxide on an alumina carrier material, said carrier material having been prepared by:

a. admixing and suspending an alpha-alumina monohydrate in a chloride anion-containing alumina sol having an aluminum chloride anion ratio of from about 1:1 to about 1.5:1, said alpha-alumina monohydrate being admixed in said sol in an amount to provide, on gelation of said sol, from about 25 to about 50 wt. % of said alumina carrier material;

b. commingling the resulting suspension with an ammonia precursor at below gelation temperature, said precursor being decomposable to ammonia with increasing temperature;

c. dispersing the suspension of step (b) as droplets in a hot oil bath effecting decomposition of said precursor and the formation of hydrogel spheres therein;

d. aging said spheres at an elevated temperature effecting decomposition of the residual ammonia precursor contained therein, and

e. washing, drying and calcining the aged alumina spheres to form said alumina carrier material.

3,923,647

FROTH FLOTATION METHOD FOR RECOVERY OF MINERALS

Vojislav Petrovich, 1925 W. Schiller St., Chicago, Ill. 60622

Continuation-in-part of Ser. No. 251,458, May 8, 1972, abandoned. This application Nov. 6, 1973, Ser. No. 409,776

Int. Cl.² B03D *1/02*

U.S. Cl. 209—166 **2 Claims**

1. An improved method of beneficiating ores selected from the group consisting of oxide ores and minerals of titanium, zirconium, cerium, thorium, vanadium niobium, tantalum, chromium, wolfram, and uranium, by froth flotation process to produce a froth concentrate of desired metal values which improvement comprises: effecting the froth flotation of the ore by treating the comminuted ore of the mineral slurry with inorganic peroxyacids or their alkali or ammonium salts, followed by an effective amount of a collector-frother of an alkyl mono-, di-, tri-olefin adduct of a glycerol, diglycerol, hexanetriol, polyoxymethylene or a mixture thereof having no more than six hydroxyl groups per molecule, said olefin having from 5 to 10 carbon atoms, said adduct having from 10 to 22 carbon atoms; and recovering a froth concentrate relatively rich in the desired metal values to leave the tailings relatively poor in desired metal values.

3,923,648

DETOXIFICATION OF ALDEHYDES AND KETONES

Everett R. Lashley, Jr., South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 7, 1973, Ser. No. 367,739

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C02C *1/02, 5/02*

U.S. Cl. 210—12 **11 Claims**

1. A method of disposal of wastewaters containing α,β-ethylenically unsaturated aldehydes selected from the class consisting of acrolein, methacrylaldehyde, crotonaldehyde, 2,4-hexadienal, and 2-ethylcrotonaldehyde or methyl vinyl ketone comprising contacting said wastewaters with sufficient base to render the pH of the wastewaters alkaline, maintaining the alkaline wastewaters at a pH of at least 8 at a temperature of about 25° to 100° C. for at least 15 minutes whereby the α,β-ethylenically unsaturated aldehydes or methyl vinyl ketone are condensed to higher molecular weight products, and then biologically degrading the waste water in a biological system containing active biomass.

3,923,649

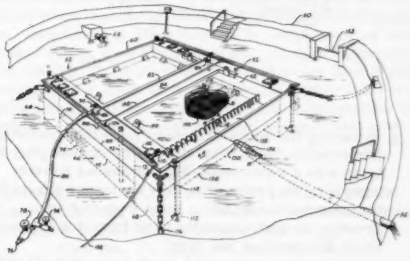
FLOATING CLARIFIER MECHANISM AND METHOD

Vaughan R. Sparham, Bournemouth, England, and Leon C. Bixby, Clark's Green, Pa., assignors to Hendrick Manufacturing Company, Carbondale, Pa.

Filed Feb. 22, 1974, Ser. No. 444,706

Int. Cl.² B01D *35/00*

U.S. Cl. 210—20 **26 Claims**



1. A method of clarifying water which comprises: accumulating water to be clarified in a basin, floating a blanket inducing upflow clarifier means with an opening thereto submerged in the accumulated water, and decanting water from said clarifier means at a level above the induced blanket and below the level of surrounding water in the basin.

3,923,650

PROCESS FOR REDUCING THE BIOLOGICAL AND CHEMICAL OXYGEN DEMAND OF SPENT ANTIBIOTIC FERMENTATION BROTH

Robert H. L. Howe, W. Lafayette, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 1, 1974, Ser. No. 457,151

Int. Cl.² B01D *13/00*

U.S. Cl. 210—21 **9 Claims**

1. A process for reducing the biological and chemical oxygen demand of spent antibiotic fermentation broth comprising:

a. commingling a coagulant with an antibiotic activity containing fermentation broth;

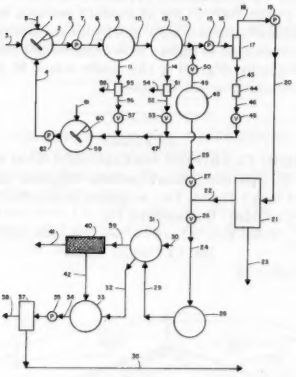
b. passing the broth from step (a) through a solids removing means;

c. flowing the broth from step (b) through a coalescing strainer;

d. elevating the pressure on the broth from step (c) to from about 200 to about 500 psig;

e. contacting the pressurized broth from step (d) with a semi-permeable membrane adapted to restrict the flow therethrough of molecules having a molecular weight slightly below that of the molecular weight of the antibiotic activity contained in such broth;

f. maintaining the contact between said pressurized broth and said semi-permeable membrane until from about 80 to 90 percent of the volume of said broth passes through said membrane essentially free of antibiotic activity becoming permeate;



g. extracting the antibiotic activity from the concentrated fermentation broth from step (f) by commingling such broth with a water-immiscible partitioning solvent;

h. separating the antibiotic activity containing solvent from the extracted fermentation broth from step (g);

i. elevating the pressure on the broth from step (h) to from about 200 to about 500 psig;

j. contacting the pressurized broth from step (i) with a semi-permeable membrane as described in steop (e);

k. maintaining the contact between said pressurized broth and said semi-permeable membrane as in step (f); and

l. commingling the permeates from steps (f) and (k) for reuse or further treatment before discharge into the environment.

3,923,651
PROCESS FOR LIQUID/LIQUID EXTRACTION

Donald Eric Weiss, Blackburn, and Hendrik Adriaan Jacobus Battaerd, North Clayton, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation and Imperial Chemical Industries of Australia and New Zealand Limited, both of Campbell, Australia

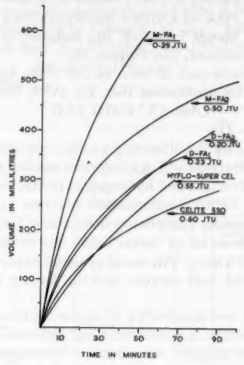
Division of Ser. No. 138,679, April 29, 1971, Pat. No. 3,890,224. This application Nov. 20, 1974, Ser. No. 525,684

Claims priority, application Australia, May 4, 1970, 1083/70

Int. Cl.[2] B01D *11/04*

U.S. Cl. 210—21 **5 Claims**

1. In the process of liquid/liquid extraction comprising extracting a compound from a solution of the compound in an aqueous liquid medium with a second organic liquid medium immiscible with the first liquid medium, the improvement consisting of separating the two liquid phases by firstly adding synthetic ferromagnetic polymeric particles being characterised in that said ferromagnetic particles preferentially absorb or adsorb the second liquid medium; and secondly removing



said particles together with the associated second liquid medium by magnetic means.

3,923,652
METHOD AND APPARATUS FOR COMPACTING FLUID SLUDGES

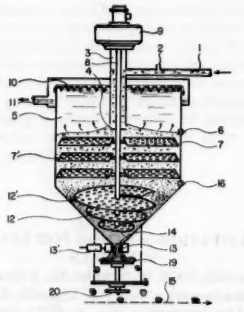
Elie Condolios, and Michel Merle, both of Grenoble, France, assignors to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), France

Filed Nov. 28, 1973, Ser. No. 419,713

Claims priority, application France, Nov. 28, 1972, 72.42253

Int. Cl.[2] C02C *3/00*

U.S. Cl. 210—67 **31 Claims**



1. A method for compacting fluid sludge including flakes of sludge smaller than a few tenths of a millimeter and an interstitial liquid, said method comprising: introducing fluid sludge into a tank; separating a portion of the interstitial liquid from said fluid sludge to produce a concentrated sludge; stirring said concentrated sludge slowly so that the flakes of sludge in said concentrated sludge increase in volume and density, stirring being accomplished by means of a plurality of inclined perforated blades mounted for rotation about a vertical shaft, the stirring speed being so chosen that break up of flakes of sludge is substantially prevented; pressing the flakes of sludge which have been stirred toward a discharge point so that movement of the flakes of sludge decreases as said discharge point is approached, so that the interstitial liquid between the flakes of sludge is moved away from said discharge point, and so that the flakes of sludge are compacted, pressing being accomplished by at least one perforated conical screw

mounted for rotation about a vertical shaft and positioned below said perforated blades; and removing the compacted sludge flakes at said discharge point, said perforated blades being inclined so as to push said flakes of sludge towards said conical screw.

3,923,653

METHOD FOR CLEANING METALLIC FILTERS OF PLASTIC WASTE

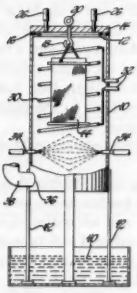
Paul N. Lavins, Jr., Grosse Pointe Farms, Mich., assignor to American Induction Heating Corporation, Detroit, Mich.

Filed Sept. 27, 1972, Ser. No. 292,563

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B01D *35/18;* **B08B** *7/00*

U.S. Cl. 210—71 **5 Claims**



3. The method of removing plastic waste from a metallic element comprising: suspending the element in an elevated position and heating the element in an atmosphere purged of oxygen, by inductive heating, until the element reaches a temperature below the auto-ignition point but above the melting point of the plastic and until gravity pulls all of the plastic with the exception of a thin layer away from the element, wherein melting of the plastic will occur only at its interface with the element, and then heating the element at a temperature above the auto-ignition point of the plastic for a sufficient period of time to cause decomposition of the thin layer of plastic so that no plastic residues remain on the metallic element.

3,923,654

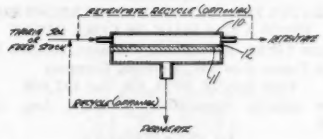
ULTRAFILTRATION MEMBRANE

Harold A. O'Hern, deceased, late of Toledo, Ohio, and by William P. Hickey, executor, Monroe County, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 30, 1974, Ser. No. 474,691

Int. Cl. B01d *37/02*

U.S. Cl. 210—75 **14 Claims**



1. In the process for forming a rigid, dimensionally stable, high-flux, anisotropic, composite, ultrafiltration membrane for use in the ultrafiltration of solute from an aqueous feed stock, wherein thoria is filtration deposited from a dilute, aqueous, colloidal thoria sol on a porous, rigid, liquid-permeable support to form said composite membrane; the improvement for increasing the initial solute rejection rate of said membrane comprising incorporating sulfate ion into said thoria sol in the molar ratio (SO_4/Th) of about 0.9×10^{-2} to about 4.5×10^{-1}.

3,923,655

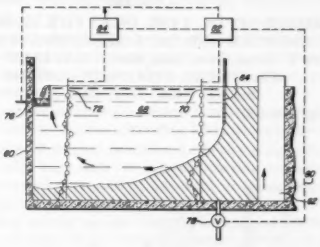
LEVEL DETECTION SYSTEM

Ross E. McKinney, Lawrence, Kans., assignor to Vesmat Investments, Inc., Fort Myers, Fla.

Filed Dec. 9, 1974, Ser. No. 530,705

Int. Cl.[2] B01D *21/24*

U.S. Cl. 210—83 **6 Claims**



4. A method for detecting the level of activated sludge in a secondary sedimentation zone in a sewage treatment process, which method comprises measuring the temperature of the lower activated sludge layer in said sludge zone and the temperature of the supernatant liquid above such activated sludge layer, determining a sharp increase in temperature of said activated sludge over the temperature of said supernatant liquid, whereby the depth of the activated sludge layer is also determined as a result of the temperature differential, and wasting activated sludge responsive to said determination to maintain a controlled level of activated sludge in said zone.

3,923,656

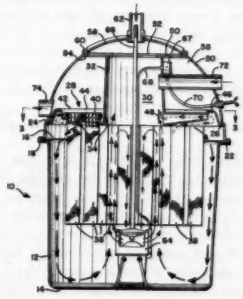
PACKAGE AEROBIC WASTE TREATMENT SYSTEM

J. Robert Krebs, and Thomas G. Abele, both of Dayton, Ohio, assignors to Multi-Flo, Inc., Dayton, Ohio

Filed Dec. 17, 1973, Ser. No. 425,556

Int. Cl.[2] B01D *33/00;* **C02C** *1/04*

U.S. Cl. 210—86 **20 Claims**



1. A waste treatment system comprising:

a. a holding tank adapted to receive predominantly liquid waste material,

b. a plurality of open mouth porous bags suspended in said holding tank and adapted to be submerged in waste material held therein,

c. means defining an effluent chamber separate from said holding tank and in communication with the interior of said open mouth bags,
d. inlet means for delivering waste material into said holding tank,
e. outlet means for removing effluent from said effluent chamber,
f. aerating means for delivering oxygen to said holding tank to promote aerobic bacterial action in said holding tank and on outer surfaces of said bags, and
g. means defining a weir in said effluent chamber intermediate said open mouths of said bags and said outlet means.

3,923,657

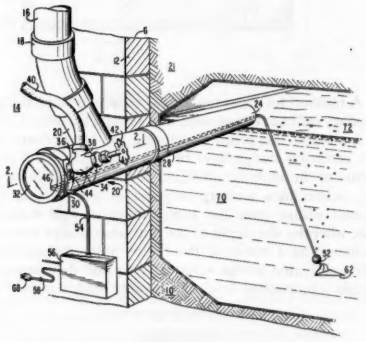
COMBINED SEPTIC TANK INLET PIPE SIGHT GLASS END PLUG AND TANK AERATOR SYSTEM

Kenneth F. Roser, River Rd., Marcy, N.Y. 13403

Filed Dec. 31, 1974, Ser. No. 537,744

Int. Cl.² C02C *1/12*; **B01F** *3/04*

U.S. Cl. 210—95 **8 Claims**



1. A combined end plug for a building septic tank inlet pipe and tank aerator comprises: a cylindrical end plug housing for sealed attachment to the building end of a horizontal septic tank inlet pipe leading from a building basement to the upper end of an underground septic tank exterior of the building and spaced therefrom, a port opening up into the interior of the cylindrical end plug housing at an angle to the longitudinal center plane passing through the housing and the port opening to effect a vortex cleansing action when liquid under pressure enters the port and impinges against the interior of the end plug housing, the improvement comprising:
a small diameter air tube projecting through said cylindrical housing,
a coilable, flexible hose of a length in excess of said inlet pipe fluid coupled to the end of the air tube interior of the plug and terminating in an aeration member, and
piston means operably coupled to said aeration member and spanning the interior of said inlet pipe at the time of initial installation of said end plug to said septic tank inlet pipe; whereby, liquid under pressure passing through said inlet pipe upstream of said piston causes said piston, said aeration member and said coiled flexible hose to move axially through said inlet pipe to the extent that said aeration member and a portion of said flexible hose falls by gravity into said septic tank,
whereby, subsequent application of air under pressure to the end of said air tube projecting exteriorly of said cylindrical housing, permits aeration of the septic tank content.

3,923,658

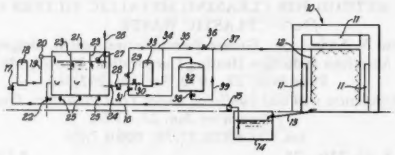
VEHICLE WASHING PLANT

Peter John Lancaster, Aldershot, England, assignor to E. B. Burdon (Engineers) Limited, England

Filed Dec. 12, 1973, Ser. No. 426,642

Int. Cl.² B01D *23/24*

U.S. Cl. 210—108 **3 Claims**



1. In a vehicle washing plant fitted with a vehicle washing chamber having an inlet and a drain, a sump connected to the washing chamber drain and a water recycling circuit providing water for a washing cycle and a rinsing cycle, the improvement wherein the recycling circuit comprises:
at least one backwash filter, said backwash filter being self-cleaning in response to the predetermined build-up of pressure at its inlet;
a first pump connected between said sump and said backwash filter inlet;
a wash water settling tank fitted with longitudinally spaced generally vertical baffles and a self-regulating make-up water inlet valve and an outlet valve adjacent a clean water end of the tank and a dirty water inlet at the opposite end, said dirty water inlet communicating with the outlet of said backwash filter;
a selector valve system having an inlet branch and at least two outlet branches;
a second pump connected between the outlet of said settling tank and said inlet branch of said selector valve system;
a main filter containing activated carbon granules, said filter comprising an inlet, an outlet, a larger downstream filter bed and a smaller replaceable upstream filter bed;
said inlet of said main filter being connected to the outlet of said settling tank through said second pump and said inlet branch and a first outlet branch of said selector valve system, and said outlet of said main filter being connected to said inlet of said washing chamber, whereby water for said rinsing cycle in said washing chamber is withdrawn from said settling tank outlet through said main filter; and
a filter by-pass conduit connected between a second outlet branch of said selctor valve system and said washing chamber inlet, whereby water for said washing cycle in said washing chamber is withdrawn directly from said settling tank outlet through said second pump and said inlet branch and said second outlet branch of said selector valve system.

3,923,659

APPARATUS FOR PROCESSING FLUSHING LIQUOR FROM A GAS MAIN OF COKE OVENS

Hansjurgen Ullrich, Schwalbach, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed July 29, 1974, Ser. No. 492,500

Claims priority, application Germany, Aug. 2, 1973, 2339080

Int. Cl.² B01D *35/18*

U.S. Cl. 210—179 **9 Claims**

1. An apparatus for processing flushing liquor from a gas main of a coke oven to obtain a watery liquid which is substantially free from tar and solids and to obtain tar which is substantially free from watery liquid and solids, said apparatus comprising:

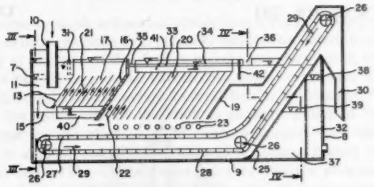
a substantially rectangular tank including a bottom wall and pairs of opposed side walls to receive said flushing liquor and form a tar and watery liquid phase boundary within the tank;

means forming a first group of inclined settlement surfaces in said tank and having a bottom entrance way lying above said tar and watery liquid phase boundary in the tank;

a liquid receiving chamber extending within said tank along at least one side wall thereof in a manner to utilize the heat of the watery liquid in the liquid receiving chamber for maintaining a desired elevated temperature of the liquid within said tank;

first adjustable overflow means in said tank above the first group of inclined settlement surfaces to control the flow of watery liquid which is substantially free of tar and solids, from the space above the inclined settlement surfaces into said liquid receiving chamber;

means communicating with said liquid receiving chamber for discharging watery liquid therefrom;



means forming a second group of inclined settlement surfaces in said tank and having a bottom entrance way lying below said tar and watery liquid phase boundary in the tank, the bottom entrance way to said second group of inclined settlement surfaces lying below the bottom entrance way to said first group of inclined settlement surfaces;

a tar-receiving chamber including second adjustable overflow means in said tank above the second group of inclined settlement surfaces to control the flow of tar from the space above the second group of inclined settlement surfaces into the tar-receiving chamber;

an inclined wall within said tank for separating and defining a consecutive arrangement of said first group of inclined settlement surfaces from said second group of inclined settlement surfaces; and

conveyor means extending into said tank below said first and second groups of settlement surfaces for discharging solids from the tank dropping out of the liquid therein.

3,923,660

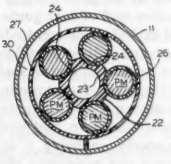
MAGNETIC APPARATUS FOR TREATING LIQUIDS CONTAINING CALCAREOUS MATTER

Merrill F. Kottmeier, 6238 Lincoln Ave., Morton Grove, Ill. 60053

Continuation of Ser. No. 275,318, July 26, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,571

Int. Cl.[2] B01D *35/06*

U.S. Cl. 210—222 **1 Claim**



1. In apparatus for the treatment and conditioning of calcareous water with magnetic lines of force:

a. a generally cylindrical outer jacket;

b. means closing the ends of said outer jacket to define a treating chamber;

c. a supply opening to and a discharge opening from said treating chamber;

d. means defining a helical path of movement in said treating chamber of said water;

e. a plurality of permanent magnet receiving tubes of non-ferrous material each of said tubes having the magnets therein arranged with like poles of contiguous magnets arranged adjacent each other to create lines of force extending laterally and longitudinally of said magnets;

i. each of said magnets being separated from an adjacent magnet by a non-ferrous spacer having a length approximately one and one-half times the diameter of said magnets,

f. means for arranging and supporting said tubes with the magnetic poles of the magnets in each tube being aligned laterally of each other with like poles of said magnets in alignment;

g. said means comprising a central tube having flutes in the outer surface thereof extending longitudinally thereof;

h. each of said magnet receiving tubes being supported in a correlative tube with the magnets therein arranged with like poles of a magnet in one tube in lateral alignment with the magnet of an adjacent tube;

i. said first named means defining a helical path for said water causing the same to cut said lines of force to condition the water.

3,923,661

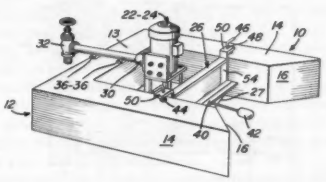
OIL SKIMMER WITH LEAD FLOAT AND HINGED WEIR

Angelo J. Crisafulli, Box 1051, Glendive, Mont. 59330

Filed June 28, 1974, Ser. No. 485,147

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—242 **6 Claims**



6. In combination with a floating vessel having means incorporated therein for receiving water and pollutants, a skimmer disposed forwardly of the vessel, said skimmer including a generally U-shaped flotation unit having a horizontal bight portion extending transversely of the bow of the vessel and forwardly extending parallel legs, a collecting and pumping unit supported between the legs of the flotation unit forwardly of the bight portion, said collecting and pumping unit including a transversely extending container disposed vertically between the legs and including projecting means thereon supportingly engaging the upper surfaces of the legs in a manner to permit removal thereof, said container including a front wall having an upper edge terminating below the level of the water in which the flotation unit and collecting and pumping unit is positioned, a transversely extending weir plate having its rear edge attached to the upper edge of the front wall by a hinge structure, the forward edge of said weir plate being swingable to vary its position in relation to the surface of the water, a mounting rod extending forwardly from and rigid with the weir plate, a float rigidly connected to the mounting rod in remote relation to the forward edge of the weir plate for controlling the position of the forward edge of the weir plate in relation to the surface of the water for skimming any pollutants floating in the water at the upper surface thereof and a predetermined layer of water whereby such pollutants and

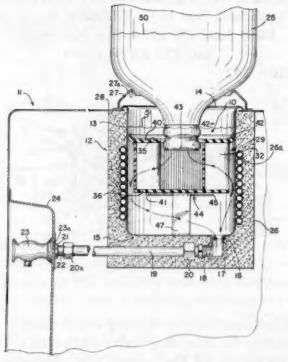
water will flow by gravity into the container, a pump and drive unit connected with the container with the pump being in communication with the bottom portion of the container and including a discharge pipe extending rearwardly beyond the bight portion of the flotation unit for discharge of water and pollutants into the floating vessel, said collecting and pumping unit being separable as a unit from the flotation unit to enable the two components to be separately transported and assembled at a site for use, and threaded members extending vertically through said lugs and having lower ends engaged adjustably with the outer surfaces of the legs of the flotation unit to vary the vertical position of the upper edge of the front wall in relation to the surface of the water, the hinge connection between the weir plate and the upper edge of the front wall of the container being provided with a flexible covering member, said upper edge of the front wall of the container and said weir plate extending substantially completely between the inner surfaces of the legs with the container being oriented rearwardly of the forward ends of the legs, said mounting rod and float being disposed centrally of the weir plate with the float being disposed forwardly of the weir plate but rearwardly of the forward ends of the legs.

3,923,662

FILTER CARTRIDGE FOR WATER COOLERS

Raymond A. O'Brien, Forest Park, Ill., assignor to Cleveland Hardware and Forging Company, Chicago, Ill.

Filed Mar. 11, 1974, Ser. No. 449,976
Int. Cl.² B01D *27/06*
U.S. Cl. 210—251 **3 Claims**



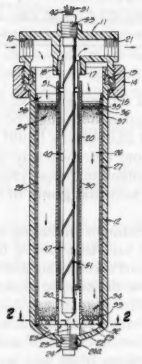
1. In combination in a water cooler: a sump means for temporarily storing and refrigerating water in said cooler, said sump means providing a generally cylindrical side wall in substantially vertical axial orientation in said cooler; a bottom wall across the lower end of said side wall, for enclosing same, an opening acorss the top of said side wall defining an inlet of said sump, an opening in/or adjacent the bottom wall defining an outlet of said sump, a water supply bottle removably disposed above said sump with its outlet located within the inlet of said sump; an improved disposable water filter cartridge removably inserted into said sump through said inlet opening for removing solid substances from flowing through said sump; and means for maintaining said water filter cartridge in vertical spatial relation to said sump bottom wall to provide a reservoir of filtered water at the bottom of said sump; said improved disposable water filter cartridge comprising a filtering media and top and bottom sealing covers which prevent water flow between said supply bottle and said outlet in said sump means without passing through said filtering media, said filtering media being in sheet form folded in double back pleats at intervals along its length and formed define an annular structure of smaller outside diameter than the inner diameter of said sump means and having substantially radially extending surfaces surrounding a hollow core, said bottom cover being a circular disc having an outer diameter smaller than the inner diameter of said sump means and a top surface sealingly engaging the bottom edges of said media, said top cover being a circular disc having a diameter larger than the inner diameter of said sump means, a bottom surface which sealingly engages the top edges of said filtering media, an elastic peripheral lip capable of forming a seal by deforming and exerting pressure on the wall of said sump in which the cartridge is inserted, and a central circular opening through said top cover adjacent and of smaller diameter than that of said core.

3,923,663

FLUID PURIFICATION DEVICE

William P. Reid, 3200 E. 29th St., Long Beach, Calif. 90806

Filed July 22, 1974, Ser. No. 490,238
Int. Cl.² B01D *35/06*
U.S. Cl. 210—251 **13 Claims**



9. A fluid purification device comprising a housing defining a chamber therein and having inlet and outlet ports communicating with said chamber;

a guide tube in said chamber, one end of said guide tube being supported by said housing in fluid flow communication with said outlet port, the other end thereof being in fluid flow communication with said inlet port;

a tubular filter element in said chamber surrounding said guide tube and in the path of fluid flow from said inlet port to said other end of said guide tube, sealing means at one end of said filter element adjacent said inlet port sealing said one end against fluid flow from said inlet port directly to the said other end of said guide tube;

said housing having threaded mounting means at opposite ends thereof aligned with said guide tube; and

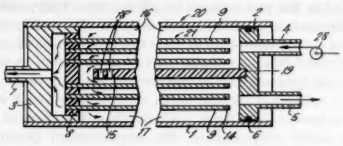
an elongate ultraviolet lamp unit having a threaded base member threadedly engaging a selected one of said mounting means and supported thereby to extend into said guide tube whereby said lamp unit may be mounted on said housing to extend into said guide tube from either end thereof.

3,923,664

REVERSE OSMOSIS APPARATUS

John Roger Grover, Reading; Ronald Gayler, Wantage, and Malcolm Hoban Delve, Wallingford, all of England, assignors to United Kingdon Atomic Energy Authority, London, England

Filed Jan. 22, 1974, Ser. No. 435,521
Claims priority, application United Kingdom, Jan. 24, 1973, 3656/73
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 5 Claims



1. Reverse osmosis apparatus comprising a pressure shell of cylindrical form, a removable plug-like holder for a membrane assembly at one end of the shell, a membrane assembly in the form of a bundle of rod-like reverse osmosis elements having fluid receiving grooves carried by said holder and extending towards the other end of the shell, a product outlet at the holder end of the shell in fluid communication with said grooves in said reverse osmosis elements, closure means for the other end of the shell comprising a removable plug-like member, shell partition means within said shell extending from said plug-like member in a direction toward said holder and projecting into said membrane assembly and dividing said membrane assembly into first and second groups of rod-like elements, said partition means dividing said shell into a first compartment containing said first group of rod-like elements and a second compartment containing said second group of rod-like elements, fluid communication means at the end of said partition means remote from said plug-like member allowing fluid communication between said first and said second compartments, an inlet for feed solution at the other end of the shell for introducing feed solution into said first compartment and an outlet for feed solution at the other end of the shell for removal of feed solution from said second compartment whereby the feed solution flows from said inlet, through said first compartment, through said fluid communication means, and through said second compartment exteriorly of the reverse osmosis elements to said outlet.

3,923,665

DEMAND BACTERICIDE FOR DISINFECTING WATER AND PROCESS OF PREPARATION

Jack L. Lambert, and Louis R. Fina, both of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 308,553, Nov. 21, 1972, Pat. No. 3,817,860, and a continuation-in-part of Ser. No. 86,246, Nov. 2, 1970, abandoned, and a continuation-in-part of Ser. No. 881,923, Dec. 3, 1969, abandoned. This application Apr. 3,1974, Ser. No. 457,633. The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.
Int. Cl.[2] C02B *3/06*
U.S. Cl. 210—501 12 Claims

1. The process for producing a triiodide demand bactericide, comprising preparing an aqueous solution of iodine which is present therein essentially as triiodide ions (I_3^-), contacting said triiodide solution with a porous granular strong base anion exchange resin having the strongly basic groups thereof in a salt form reactable with triiodide ions, and contacting being continued until sufficient triiodide has reacted with said strongly basic groups that bacterially contaminated water is disinfected when passed through a bed of the reacted resin, and removing water-elutable iodine from said resin, said removing being continued until the reacted resin can be washed with distilled water at a temperature of 25° to 30° C. without obtaining in the wash water a concentration of oxidizing iodine detectable by reacting said wash water with a cadmium iodide-linear starch test reagent.

2. The triiodide demand bactericide produced by the process of claim 1.

3,923,666

METHOD AND COMPOSITION FOR ACIDIZING AND FRACTURING WELLS

Walter R. Dill, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 26, 1973, Ser. No. 336,150
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—8.55 C 20 Claims

1. A method for preparing a gelled acid useful for acidizing or fracturing subterranean earth formations, which comprises:
mixing a water soluble, linear polyacrylamide having a molecular weight in the range of about 1 to about 50 million, an aqueous hydrochloric acid solution containing an amount of hydrochloric acid effective to produce a substantially homogeneous gel, and an aldehyde compound soluble in aqueous solutions;
wherein the mixing ratio of said polyacrylamide to said acid solution is in the range of about 25 to about 150 pounds of said polyacrylamide per 1,000 gallons of said acid solution.

12. The method of treating a permeable, subterranean formation to enhance the productivity of hydrocarbons therefrom which comprises:
mixing from about 25 to about 150 pounds of a water soluble linear polyacrylamide having a molecular weight of from about 1 to about 50 million with each 1,000 gallons of a composition consisting essentially of an aqueous hydrochloric acid solution containing at least 25 weight percent hydrochloric acid to develop a stable, pumpable acid gel;
injecting said stable, pumpable acid gel into the interstices of said permeable, subterranean formation; then
injecting an effective amount of an aldehyde compound soluble in aqueous solutions into the interstices of the permeable formation to mix the aldehyde with the pumpable acid gel in situ, and thereby increase the viscosity of the gel present in the formation interstices by in situ reaction of the aldehyde compound with the pumpable acid gel.

15. A high viscosity acidic gel composition useful in fracturing, acidizing and propping operations in the production of hydrocarbons from subterranean formations consisting essentially of a methylol hydrochloride salt of a linear polyacrylamide having a molecular weight exceeding 1 million and produced by reacting a water soluble linear polyacrylamide having a molecular weight of from about 1 to about 50 million with hydrochloric acid in an aqueous environment to yield a hydrochloride salt of said linear polyacrylamide, then, reacting an aldehyde compound soluble in aqueous solutions with said hydrochloride salt.

3,923,667

HIGH TEMPERATURE NIO RUBBING SEAL MATERIAL CONTAINING CUO AND CAF_2

Irwin M. Lachman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,598
Int. Cl.[2] C04B *35/02;* C10M *5/02*
U.S. Cl. 252—12 8 Claims

1. A sintered ceramic sliding seal for contacting a ceramic regenerator in a gas turbine engine analytically consisting essentially of, by weight, 8–76% NiO, 10–52% CuO and 5–40% of a metal fluoride selected from CaF_2, SrF_2 and combinations thereof.

3,923,668
GUANIDINE CARBONATE DISPERSION COMPOSITION

Thomas Emmett Johnston, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 24, 1974, Ser. No. 482,571
Int. Cl.² C10M *1/32, 3/26;* **C10L** *1/32, 1/22*
U.S. Cl. 252—16 **9 Claims**

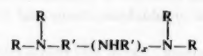
1. A stable dispersion of guanidine carbonate and ashless dispersing agent in mineral oil comprising, based on percent by total weight,

i. from 1% to 50% of guanidine carbonate having a particle size in the range of from 0.001 to 0.1 micron,

ii. from 1% to 25% of at least one oil-soluble, ashless dispersing agent selected from the group consisting of

a. an aliphatic hydrocarbylsuccinic acid and derivatives thereof wherein the hydrocarbyl group has 30 to 200 carbon atoms, said derivative being selected from the group consisting of anhydride, ester, amide and aminoimide,

b. an aliphatic hydrocarbyl-substituted polyalkylene polyamine of the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl, and aliphatic hydrocarbyl containing from 30 to 200 carbon atoms, at least one R being said hydrocarbyl group, R′ is an alkylene radical having 2 to 3 carbon atoms and *x* is 0 to 5, and

c. a basic amino nitrogen-containing addition type copolymer containing in copolymerized form at least one polymerizable ethylenically unsaturated monomer, free of amino-nitrogen and containing an aliphatic hydrocarbyl chain of from 8 to 18 carbon atoms, and at least one polymerizable ethylenically unsaturated monomer containing basic amino nitrogen, said copolymer containing 0.1 to 3.0% by weight of said basic amino nitrogen, said copolymer having an inherent viscosity of 0.1 to 3.0 as determined at 0.1% weight volume concentration in benzene at 25°C., and

iii. from 25% to 98% of mineral oil having a 100°F. viscosity of from 30 to 1,500 SUS.

3,923,669
ANTIWEAR HYDRAULIC OIL

Thomas D. Newingham, West Chester, and Alexander D. Recchuite, Boothwyn, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Oct. 31, 1974, Ser. No. 519,728
Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E **10 Claims**

1. A composition, useful as an anti-wear hydraulic oil or as a gear lubricant, comprising major amounts of a mineral lubricating oil and minor, effective and mutually compatible amounts of a secondary zinc dialkyl dithiophosphate anti-wear agent, chelating type and film forming type metal deactivators, and, as rust inhibitors, a neutral barium salt of a petroleum sulfonate and an alkyl or aryl substituted succinic acid or acid anhydride.

3. The composition of claim **1**, wherein said chelating type metal deactivator is an alkyl-substituted derivative of 2,5-dimercapto-1,3,4-thiodiazole.

7. The composition of claim **5** and containing tetra phenyl succinic anhydride.

3,923,670
OVERBASED PHENATES

John Crawford, Pemberley, 15 Ashcourt Drive, Hornsea, East Yorkshire, England

Filed Feb. 27, 1974, Ser. No. 444,426
Claims priority, application United Kingdom, Feb. 22, 1973, 8629/73
Int. Cl.² C10M *1/54, 3/48, 5/28, 7/52*
U.S. Cl. 252—42.7 **6 Claims**

1. In a process for the production of an overbased sulfurized alkaline earth metal alkylphenate wherein an alkylphenol having from 8 to 30 carbons in the alkyl group and sulfur are reacted in the presence of an alkali metal hydroxide to form a sulfurized alkylphenol and wherein the sulfurized alkylphenol is contacted with at least two molar parts of an alkaline earth metal base per molar part of alkylphenol in said sulfurized alkylphenol and in the presence of ethylene glycol to form a sulfurized alkaline earth alkylphenate which is thereafter carbonated to form said overbased sulfurized alkaline earth metal alkylphenate, the improvement comprises (1) reacting said alkylphenol and sulfur in the presence of 0.2–1.3 molar parts of an alkali metal hydroxide per molar part of alkylphenol and (2) conducting said contacting and said carbonation steps in the presence of said alkali metal hydroxide.

3,923,671
METAL WORKING LUBRICANT

James E. Knepp, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 3, 1974, Ser. No. 511,776
Int. Cl.² C10M *1/06, 3/04, 5/04, 7/08*
U.S. Cl. 252—49.5 **8 Claims**

1. A metal working lubricant dispersible in an aqueous media comprising:

a. a fatty acid containing at least 12 carbon atoms including at least one carboxylic acid group;

b. an aliphatic carboxylic acid ester;

c. at least one emulsification agent; and

d. mineral oil.

8. A metal working lubricant comprising a dispersion of from 10 to 30 parts by weight neat oil and from 70 to 90 parts by weight water, said neat oil comprising in parts by weight.

1. from 2 to 8 parts of a carboxylic acid having the formula $C_mH_{2m-n}(COOH)_r$ wherein m is an integer from 13 to 17, *n* is 0 or an even integer from 2 to 6 and *r* is at least 1 and not greater than 2;

2. 10 to 20 parts of an aliphatic carboxylic acid ester comprising the condensation product of one or more 6 18 carbon monocarboxylic acids with a polyol;

3. 2 to 10 parts of at least one emulsification agent selected from the group consisting of esters or ethers of 12 to 18 carbon monocarboxylic acids; and

4. from 60 to 80 parts by weight of a mineral oil having a sufficient initial viscosity to provide a viscosity of the neat oil mixture of from 250 to 450 SSU at 100°F.

3,923,672
TURBINE OIL COMPOSITIONS

Albert M. Durr, Jr., and Robert A. Krenowicz, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 7, 1974, Ser. No. 512,765
Int. Cl.² C10M *1/10, 3/02, 5/02, 7/02*
U.S. Cl. 252—49.9 **16 Claims**

1. A turbine oil composition comprising a major amount of a mineral or synthetic hydrocarbon base lubricating oil and the following combination of materials in the amounts specified as weight percent of total composition:

a. about 0.05 to about 1.5 -triphenyl phosphite or trialkyl-substituted phenyl phosphite having 1 or 2 alkyl substituents, each of which contains 1 to 12 carbon atoms;

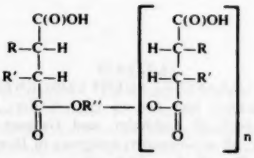
b. about 0.02 to about 0.75 diphenylamine or alkylated diphenylamines containing 1 or 2 alkyl groups, on one or

both phenyl moieties, containing from about 4 to about 16 carbon atoms;

c. about 0.10 to about 0.75 phenyl α-naphthylamine, phenyl β-naphthylamine, phenyl α-naphthylamine having 1 or 2 alkyl or alkaryl substituents, each of which contains 1 to about 16 carbon atoms, and phenyl β-naphthylamine having 1 or 2 alkyl or alkaryl substituents, each of which contains 1 to about 16 carbon atoms;

d. about 0.002 to about 0.10 -benzotriazole or alkyl-substituted benzotriazoles having 1 or 2 alkyl groups containing 1 or 2 alkyl groups containing 1 to 10 carbon atoms; and

e. about 0.02 to about 0.50 -partial ester of an alkyl or alkenyl succinic anhydride, which is represented by the formula



wherein of the radicals R and R', one is hydrogen and the other is an alkyl or alkenyl group containing from 8 to 15 carbon atoms, R'' is a residue of a polydric alcohol containing from 3 to 6 carbon atoms, and *n* is an integer of at least one but less than five.

3. The turbine oil composition of claim 2 wherein it contains about 0.05 to about 1.50 weight percent of a copolymer of 1 mole N-vinyl-2-pyrrolidone and 0.5 to 12 moles of an α-olefin containing 8 to 30 carbon atoms.

3,923,673

METAL DEFORMING PROCESS

Klaas Van Henten, Delft; Cornelis Couvee, Rotterdam, and Dirk De Jager, Delft, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 9, 1973, Ser. No. 414,488

Claims priority, application United Kingdom, Mar. 9, 1973, 11455/73

Int. Cl.² C10M *1/16*

U.S. Cl. 252—59 **6 Claims**

1. A process for deforming metal which comprises applying to the surface of said metal a composition comprising 5–50% by weight of a non-hydrogenated block copolymer having at least one homo polymer block of a monoalkenylarene selected from the group consisting of styrene, alpha-methylstyrene and tert-butyl styrene, said block having an average molecular weight between about 4000 and 100,000 and at least one homo polymer block of a conjugated diene selected from the group consisting of butadiene and isoprene, said block having an average molecular weight between about 20,000 and 1,000,000, and 50–95% by weight of a hydrocarbon lubricant, said lubricant containing no more than about 30% by weight of aromatic hydrocarbons and subjecting the metal so treated to deforming operations.

3,923,674

THERMAL INSULATION MATERIALS AND METHODS OF MAKING SAME

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 739,895, June 9, 1968, abandoned, which is a continuation of Ser. No. 502,570, Oct. 22, 1965, abandoned, which is a continuation of Ser. No. 285,601, June 5, 1963, abandoned. This application Jan. 2, 1970, Ser. No. 493

Int. Cl.² C23F *11/18*

U.S. Cl. 252—62 **5 Claims**

1. The method of making a structural insulation material which inhibits chloride ion stress corrosion of stainless steel and which has improved strength, comprising: preparing an aqueous slurry of an inert insulation filler, an alkaline earth metal oxide containing material from the group consisting of lime and magnesium hydroxide, and SiO_2 reactable with lime, said slurry having a water to solids ratio of at least 6:1 and a soluble chloride concentration of less than 1,000 ppm based on solids, forming a filter cake of the solids, filtering a solution of sodium silicate through the filter cake to impregnate the filter cake with an amount of sodium silicate to leave a weight ratio of sodium silicate to soluble chloride of at least 50 to one after hardening of the binder, causing the alkaline earth containing material to harden into a strong crystalline binder having from 1% to 15% by weight of said soluble sodium silicate dispersed throughout the insulation material, and drying the shaped body so produced.

5. The method of making a strong porous light weight shaped body which inhibits chloride ion stress corrosion of stainless steel and which has the strength of a structural insulation, comprising: preparing an aqueous slurry of an inert insulation filler, an alkaline earth metal oxide containing material from the group consisting of lime and magnesium hydroxide, and SiO_2 reactable with lime, said slurry having less than 1,000 ppm of soluble chloride based on the solids, mixing solid sodium silicate with the slurry while controlling the temperature and time of contact to give from 1% to approximately 15% by weight of solid sodium silicate in the slurry, shaping the solids of the slurry while retaining the solid sodium silicate therein, and causing the alkaline earth containing material to harden into a strong crystalline binder to provide a resultant insulation material having sodium silicate present in an amount at least 50 times the chloride ion.

3,923,675

METHOD FOR PREPARING LEAD LANTHANUM ZIRCONATE-TITANATE POWDERS

Khodabakhsh S. Mazdiyasni, Xenia, and Leanne M. Brown, Brookville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 9, 1973, Ser. No. 386,923

Int. Cl.² C04B *35/46, 35/48, 35/50*

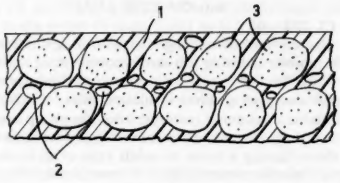
U.S. Cl. 252—62.9 **9 Claims**

1. A method for preparing lead lanthanum zirconate titanate (PLZT) powder which comprises adding to water a mixture consisting essentially of lead isoamyloxide, a lanthanum alkoxide, a zirconium alkoxide and a titanium alkoxide in solution in isoamyl alcohol, the alkoxides corresponding to the formulae $La(OR)_3$, $Zr(OR)_4$ and $Ti(OR)_4$, wherein R is an alkyl radical containing 3 to 6, inclusive, carbon atoms; refluxing the solution at a temperature in the range of about 70° to 75°C for a period of about 2 to 5 hours to hydrolytically decompose said isoamyloxide and alkoxides into a hydroxide of lead, lanthanum, zirconium and titanium; washing the resulting hydroxide; and drying the hydroxide by heating same under a vacuum, thereby obtaining a high purity, amorphous PLZT powder.

3,923,676
INSULATIVE ADHESIVE MIXTURE RESISTANT TO STRONG ELECTRICAL FIELDS

Vilho Albert Räsänen, Tervakoski 12400, Finland

Filed May 25, 1973, Ser. No. 364,133
Claims priority, application Finland, June 9, 1972, 1648/72
Int. Cl.² H01B *3/10*
U.S. Cl. 252—63.2 **9 Claims**



1. A glue mixture to be used in objects subject to strong electrical fields such as in glue splices of electrical capacitor tissues, comprising:

a. a glue component selected from the group consisting of methyl cellulose, starch, arabium, dextrin and plastic adhesives; and

b. particles of a poorly conducting substance mixed with the adhesive component,

the particle content ranging from 50 to 5,000 per cent by weight of the adhesive material,

the particle size ranging from 0.01 μm to a few micrometers, the particles being of a substantially uniform size, the cross-sectional contours of the particles being evenly curved, and

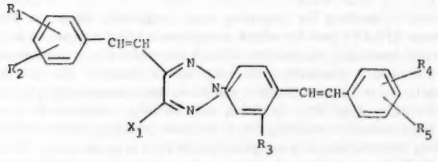
the ratio of the maximum and the minimum dimension of the particles being less than 10 to 1.

3,923,677
2-STILBENYL-4-STYRYL-V-TRIAZOLES, THEIR USE FOR THE OPTICAL BRIGHTENING OF ORGANIC MATERIALS, AND PROCESSES FOR THEIR MANUFACTURE

Guglielmo Kabas, Binningen; Hans Schlaepfer, Basel, and Ian John Fletcher, Muenchenstein, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 237,204, March 22, 1972, Pat. No. 3,862,179. This application Oct. 24, 1974, Ser. No. 517,697
Claims priority, application Switzerland, Mar. 31, 1971, 4702/71
Int. Cl.² C11D *3/42*
U.S. Cl. 252—89 **3 Claims**

1. A detergent characterized in that it contains from 0.001 to 0.5 percent by weight of an optical brightener of the formula



wherein

X_1 denotes hydrogen, halogen, methyl or optionally substituted phenyl,

R_1 denotes hydrogen, halogen, alkyl with 1 to 4 carbon atoms, optionally substituted phenyl or alkoxy with 1 to 4 carbon atoms, or together with R_2 in the o-position denotes a fused benzene ring,

R_2 denotes hydrogen, halogen, alkyl with 1 to 4 carbon atoms or alkoxy with 1 to 4 carbon atoms, or together with R_1 in the o-position denotes a fused benzene ring,

R_3 denotes hydrogen, a nitrile group, an optionally functionally modified sulpho group or an optionally functionally modified carboxyl group,

R_4 denotes hydrogen, halogen, a nitrile group, alkyl with 1 to 4 carbon atoms, optionally substituted phenyl, alkoxy with 1 to 4 carbon atoms, optionally functionally modified carboxyl or an optionally functionally modified sulpho group and

R_5 denotes hydrogen, alkyl with 1 to 4 carbon atoms or alkoxy with 1 to 4 carbon atoms.

3,923,678
LIQUID CLEANSING AGENT CONCENTRATES

Hans-Jerg Kleiner, Bad Soden; Otto Koller; Karl-Heinz Schneider, both of Kelkheim, and Gerhart Schneider, Schneidhain, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 30, 1974, Ser. No. 519,247
Claims priority, application Germany, Oct. 30, 1973, 2354223
Int. Cl.² C11D *1/00*
U.S. Cl. 252—89 **3 Claims**

1. Liquid aqueous cleansing agent concentrates on the basis of non-ionic, surface-active compounds, having a content of compounds of the general formula

(I)

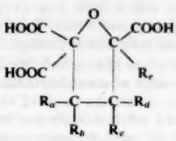
wherein R_1 is a straight-chained or branched alkyl or alkenyl radical having 4 to 16 carbon atoms, R_2 is alkyl having 1 to 4 carbon atoms and Y is hydrogen or the sodium or potassium ion wherein the content of compounds of the general formula is about 1 to 5% by weight.

3,923,679
SALTS OF TETRAHYDROFURAN POLYCARBOXYLIC ACIDS AS DETERGENT BUILDERS AND COMPLEXING AGENTS

John N. Rapko, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 385,131, Aug. 2, 1973, Pat. No. 3,835,163. This application June 6, 1974, Ser. No. 476,825
Int. Cl.² C11D *7/54*
U.S. Cl. 259—99 **16 Claims**

1. A detergent formulation comprising (a) from 1 to 95% by weight of an alkali metal, ammonium or alkanol ammonium salt of a compound represented by the formula



wherein R_a, R_b, R_c, R_d, and R_e are selected from the group consisting of hydrogen and COOH, at least one of R_a, R_b, R_c and R_d being COOH when R_e is COOH and (b) from 0.5 to 95% by weight of a surfactant selected form the group consisting of water soluble anionic, nonionic, amphoteric and zwitterionic surfactants.

3,923,680

AGGLOMERATED RUBBER CHEMICALS

Henning Roeder; Günter P. Langner, both of Leichlingen; Bernd Scherhag, Leverkusen; Hans-Lothar Nickenig, Leverkusen-Steinbuechel, all of Germany, and René Loix, Leuven-Heverlee, Belgium, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 31, 1972, Ser. No. 285,200

Claims priority, application Germany, Sept. 4, 1971, 2144378

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] E09K *3/00*

U.S. Cl. 252—182 **1 Claim**

1. A free-flowing, binder-free solid rubber chemical in the form of a smooth surfaced spherical agglomerate of individual particles, said rubber chemical being at least one member selected from the group consisting of vulcanization accelerators, vulcanization retarders, antiagers, antiozonants, masticating agents, regenerating agents and mixtures thereof, said agglomerate of individual particles being produced by the agglomeration process of atomizing a binder-free suspension of at least one of said rubber chemicals having a purity of greater than 95 percent and an average diameter of less than 60 μ with a solids content of from 5 to 60 percent by weight and a viscosity of from 0.5 to 100 cP at 20° C. into a hot gas stream which has an inlet temperature of from 150° to 350° C. and an outlet temperature below 120° C., recovering and returning particles with an average diameter of less than about 60 μ to the agglomeration process and recovering resulting agglomerated particles with a moisture content of less than 1 percent by weight and an average diameter from about 60 μ to 500 μ.

3,923,681

IMIDAZOLE-THIO SEMICARBAZONE SUNSCREEN AGENTS

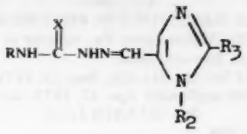
Paul L. Warner, Jr., Clarence, N.Y., assignor to Westwood Pharmaceuticals, Inc., Buffalo, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,684

Int. Cl.[2] C07D *233/84*; **G02B** *5/23*; **A61K** *7/42*

U.S. Cl. 252—300 **8 Claims**

1. Compounds having the formula



where R is hydrogen, alkyl, alkenyl, or aryl; X is sulfur; and R_2 and R_3 are methyl.

8. A process for protecting light-sensitive subjects against ultraviolet radiation which comprises filtering such radiation by means of a radiation-absorbing amount of a sunscreen agent as defined in claim 1.

3,923,682

PROCESS FOR MANUFACTURING PHOSPHORS

Ernest A. Dale, Hamilton; Leonard V. Dullea, Salem, and Martha J. B. Thomas, Winchester, all of Mass., assignors to Sylvania Electric Products, Inc., Danvers, Mass.

Filed Dec. 29, 1969, Ser. No. 888,876

Int. Cl.[2] C09K *11/10, 11/12, 11/24, 11/42, 11/44*

U.S. Cl. 252—301.6 P **5 Claims**

1. The process of manufacturing an antimony activated calcium halophosphate phosphor comprising the steps of:

a. preparing a solution containing calcium nitrate, antimony chloride, hydrofluoric acid, cadmium nitrate and phosphoric acid;

b. atomizing said solution into droplets;

c. drying said droplets to produce particles having a predetermined particle size range;

d. transporting said particles into a heated fluidizing bed comprising an inert granular material which is in constant motion during operation, and

e. heating said particles therein to a temperature sufficient to form a phosphor matrix.

3,923,683

AMIDES AND HYDROPHOBIC SILICA AS ANTIFOAMS

Raymond J. Michalski, Riverdale, and Roger W. Youngs, Hinsdale, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 178,508, Sept. 7, 1971, abandoned. This application Jan. 9, 1974, Ser. No. 432,125

Int. Cl.[2] B01D *19/04*

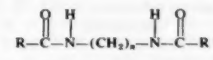
U.S. Cl. 252—321 **6 Claims**

1. An antifoam composition comprising a blend of:

A. a liquid hydrocarbon oil having concentration ranging between 70 to 98.8% by weight;

B. a finely divided hydrophobic silica having a concentration ranging between 0.1 to 5.0% by weight;

C. a bis-amide in a concentration ranging between 1 to 20% by weight having the following structure:



where:

n is an integer from 1 to 6; and

R is a saturated or unsaturated, straight or branched chain aliphatic group having from 5 to 22 carbon atoms; and

D. a silicone oil having a concentration ranging between 0.1 to 5.0% by weight.

3,923,684

MOISTURE INDICATOR FOR PHOTOFLASH LAMP

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Division of Ser. No. 211,450, Dec. 23, 1971, Pat. No. 3,770,362. This application Apr. 12, 1973, Ser. No. 350,309
Int. Cl.² G01N 31/22
U.S. Cl. 252—408 3 Claims

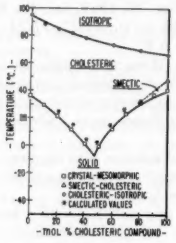
1. A moisture indicating material for disposition upon a glass surface within the sealed envelope of a lamp to indicate the presence of air therein, said indicating material consisting essentially of a mixture of cobaltous cobalticyanide and between about 1% to about 20% by weight of partially hydrolyzed polyvinyl alcohol.

3,923,685

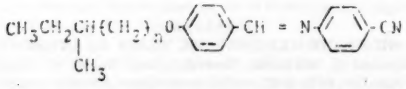
LIQUID CRYSTAL COMPOSITIONS

Chan Soo Oh, Fullerton, Calif., and Edward F. Pasierb, Hamilton Square, N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 298,339, Oct. 17, 1972, Pat. No. 3,792,915. This application Oct. 18, 1973, Ser. No. 407,546
Int. Cl.² C09K 3/34
U.S. Cl. 252—408 LC 3 Claims



1. A cholesteric mixture comprising from 5–80 percent by weight of an optically active compound of the formula



wherein *n* is an integer from 1 to 5 and a nematic liquid crystal having positive dielectric anisotropy composition.

3,923,686

FLUIDIZED CATALYST REGENERATION BY OXIDATION IN A DENSE PHASE BED AND A DILUTE PHASE TRANSPORT RISER

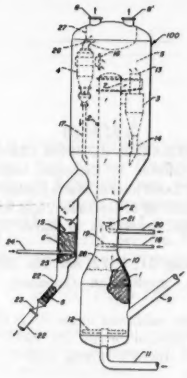
Laurence O. Stine, Western Springs, and Algie J. Conner, Downers Grove, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

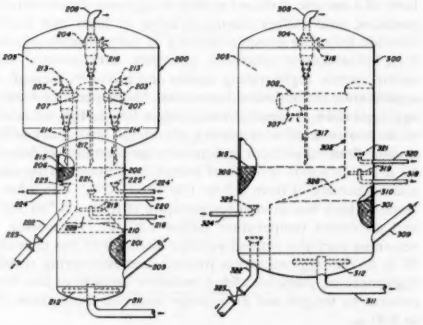
Continuation of Ser. No. 258,042, May 30, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,455. The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.
Int. Cl.² B01J 29/38, 21/20; C10G 11/04
U.S. Cl. 252—417 3 Claims

1. A process for the regeneration of a zeolite-containing or an amorphous coke-contaminated spent hydrocarbon cracking catalyst, removed from a reaction zone, and the conversion of carbon monoxide, resulting from the oxidation of coke from said catalyst, to carbon dioxide, which process is operated within a pressure range of from about normal atmospheric to about 50 psig, said process comprising the steps of:

a. passing said catalyst and a fresh free oxygen-containing regeneration gas to a first dense bed of fluidized particulate catalyst in a regeneration zone and oxidizing coke in said first dense bed maintained at oxidizing conditions including a temperature within the range of about 1250° to about 1400°F., a superficial gas velocity within the range of about 3 to about 10 feet per second, and a catalyst residence time of less than two minutes, to produce partially spent regeneration gas, containing CO, and regenerated catalyst having residual coke thereon;

b. passing said regenerated catalyst and partially spent regeneration gas to a dilute phase transport riser communicating with and superimposed over said first dense bed; introducing into said dilute phase transport riser a fuel gas or a liquid hydrocarbon stream in an amount sufficient to heat the regenerated catalyst passing through said riser to





a predetermined temperature within the range of about 1250° to 1400°F. and also introducing into said dilute phase transport riser a second fresh free-oxygen containing regeneration gas to support burning of said fuel gas or liquid hydrocarbon stream; and, controlling the temperature within said dilute phase transport riser including controlling the temperature within the range of about 1275° to 1425°F. and the superficial gas velocity within the range of about 10 to 25 feet per second to produce regenerated catalyst as said predetermined temperature and to convert CO to CO_2 to produce spent regeneration gas;

c. separating the thus-heated catalyst from said spent regeneration gas; and,

d. introducing said regenerated catalyst to a second dense bed of particulate material, from which said regenerated catalyst is returned to said reaction zone.

3,923,687

PROCESS FOR ACTIVATING CATALYST COMPONENT USEFUL FOR POLYMERIZING PROPYLENE

Isoo Shirai; Takeshi Suzuki, and Koichi Tonooka, all of Ichihara, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 160,341, July 7, 1971, abandoned. This application May 29, 1973, Ser. No. 364,587
Claims priority, application Japan, July 14, 1970, 45-61667
Int. Cl.² B01J *31/14*
U.S. Cl. 252—429 C **3 Claims**

1. In the method of producing a catalyst useful in the production of crystalline propylene polymer, which catalyst consists essentially of

I. $TiCl_3.0.33AlCl_3$ and

II. a dialkylaluminum monohalide having a general formula of AlR_2X, wherein R is a hydrocarbon radical and X is a halogen atom, or a combination of an alkylaluminum dihalide having a general formula of $AlR'X_2$, wherein R' is a hydrocarbon radical and X is a halogen atom, and $Si(OC_2H_5)_4$, the improvement of:

A. preparing said $TiCl_3.0.33AlCl_3$ by reacting $TiCl_4$ with Al powder in a mol ratio of $TiCl_4$ to Al greater than 3:1,

B. removing unreacted $TiCl_4$ until the $TiCl_4$ content is within the range of 0.01 to .1% by weight,

C. size-controlling the resulting powders of $TiCl_3.0.33AlCl_3$ by ball-milling in a revolving or vibrating ball-mill containing the same or substantially the same size of steel or stainless steel balls having a diameter of 25 – 50 mm, at room temperature, to give a size-controlled powder consisting of 50% or more of the particles of 325 meshes on and less than 50% of the particles of 325 meshes pass, and

D. subjecting the size-controlled powders to a heat treatment:

1. at a temperature (T) which satisfies the conditions $100° C. \leqq T \leqq 250°C.$,

2. at a pressure (P) which satisfies the conditions $0.01 \text{ mm Hg} \leqq P \leqq 760 \text{ mm Hg}$,

3. for a time (Q) which satisfies the condition 1 minute $\leqq Q \leqq 300$ minutes

and wherein the following relationship between T, P and Q is maintained:

4. $9.52 \times 10^{-3}T - 6.26 \times 10^{-3}P + 3.98 \times 10^{-4}Q \geqq 1$

5. $3.53 \times 10^{-3}T + 2.94 \times 10^{-4}P + 3.54 \times 10^{-4}Q \geqq 1.$

3,923,688

THERMALLY STABLE AND CRUSH RESISTANT MICROPOROUS GLASS CATALYST SUPPORTS AND METHODS OF MAKING

Joseph J. Hammel, and Ties Allersma, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 311,191, Dec. 1, 1972, Pat. No. 3,843,341, which is a continuation-in-part of Ser. Nos. 231,346, March 2, 1972, abandoned, and Ser. No. 264,081, June 19, 1972, abandoned. This application Mar. 1, 1974, Ser. No. 447,194
Int. Cl.² B01J *21/02, 21/08*
U.S. Cl. 252—432 **8 Claims**

1. In a microporous glass article having a catalytic coating deposited thereon, the improvement of using as the microporous glass catalyst support, a strong, thermally stable, microporous glass article having a pore volume of at least 0.35 cubic centimeters per gram, pore sizes ranging from 50 to 200 Angstrom units, and a surface area of at least 100 square meters per gram, consisting essentially of:

a. at least 96 percent by weight SiO_2,

b. less than 4 percent by weight B_2O_3,

c. less than 0.05 percent by weight alkali metal oxide, and

d. less than 0.4 percent by weight Al_2O_3;

said microporous glass article having a crush strength of at least 20 pounds per square inch gauge, and losing less than 30 percent of its original surface area and undergoing less than 25 percent volume shrinkage when the article is subjected to a temperature of 980°C. for 24 hours.

3,923,689

REMOVAL OF IRON CONTAMINANTS FROM POROUS MATERIALS

Clifton William Broughton, Hallsville, Tex., and Joseph Tucker Truemper, Wilmington, Del., assignors to ICI United States Inc., Wilmington, Del.

Filed Nov. 29, 1972, Ser. No. 310,271
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B01J *21/18*
U.S. Cl. 252—444 **7 Claims**

1. In a method for removing iron from a porous carbonaceous material wherein the porous carbonaceous material is treated with an acidic solution, the improvement comprising including in said solution a reducing agent selected from the group consisting of hydrazine, thiosulfates, sulfites, nitrites, and hydroxyl amine, provided that the amounts of acid and reducing agent in said solution are sufficient to solubilize the iron.

3,923,690

CARRIER-SUPPORTED CATALYST

Wilhelm Vogt, Hurth-Efferen; Hermann Glaser, and Helmut Dyrschka, both of Erftstadt Lechenich, all of Germany, assignors to Hoechst Aktiengesellschaft, Cologne, Germany

Filed May 6, 1974, Ser. No. 467,054
Claims priority, application Germany, May 9, 1973, 2323262; Mar. 14, 1974, 2412162
Int. Cl.² B01J *21/18, 23/10, 21/04*
U.S. Cl. 252—447 **22 Claims**

1. A carrier-supported catalyst comprising a mixture of aluminates of copper, manganese and nickel as its active ingredients and aluminum oxide as its carrier, the total proportion of aluminates being within the range 10 to 45 wt. %.

3,923,691

HYDROTREATING CATALYST

David G. Braithwaite, Brookhaven, Miss.; Carl F. Cross, and Michael R. Basila, 3, both of Munster, Ind., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 277,733, Aug. 3, 1972, Pat. No. 3,840,477. This application Mar. 22, 1974, Ser. No. 453,941. The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.
Int. Cl.² B01J *29/06*
U.S. Cl. 252—455 R **9 Claims**

1. A process of preparing a catalyst or catalyst support which comprises mixing alumina particles in the form of spheres, pellets, or a powder with aqueous silica acid sol in an amount and for a period of time sufficient to form a surface coating of SiO_2 on said alumina which coating after removing excess liquid, drying and calcining constitutes less than 2.5% SiO_2, based on the weight of Al_2O_3, but is sufficient to enhance the hydrotreating activity of said catalyst, and thereafter removing excess liquid, drying and calcining the resultant mixture.

3,923,692

HYDROTREATING CATALYST

David G. Braithwaite, Brookhaven, Miss.; Carl F. Cross, and Michael R. Basila, both of Munster, Ind., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 277,733, Aug. 3, 1972, Pat. No. 3,840,477. This application Mar. 22, 1974, Ser. No. 453,942. The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 R 9 Claims

1. A process of preparing a catalyst or catalyst support which comprises mixing alumina particles in the form of spheres, pellets or a powder with an aqueous solution of sodium hydroxide and sodium silicate in an amount and for a period of time sufficient to form a surface coating of SiO_2 on said alumina which coating after removing excess liquid, drying and calcining constitutes less than 2.5% SiO_2, based on the weight of Al_2O_3, but is sufficient to enhance the hydrotreating activity of said catalyst, thereafter removing excess liquid, drying and calcining the resultant mixture.

3,923,693

CATALYST FOR REDUCING NITROGEN OXIDES CONTAINED IN COMBUSTION EXHAUST GAS, AND PROCESS FOR PREPARING SAME

Toshiyuki Sakai, Funabashi; Kazuhide Miyazaki, Tanashi, and Kiyomi Abe, Kokubunji, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,017

Claims priority, application Japan, Jan. 31, 1973, 48-11917

Int. Cl.[2] B01J *21/04, 21/06, 23/74*

U.S. Cl. 252—459 11 Claims

1. A catalyst for reducing nitrogen oxides contained in combustion exhaust gas, comprising as the catalytically effective component at least one carbonyl metal which is a member selected from the group consisting of powdery carbonyl iron, carbonyl cobalt and carbonyl nickel, said powdery carbonyl metal being the metal produced by the thermal decomposition of the corresponding metal carbonyls.

3,923,694

METHANOL SYNTHESIS CATALYST

Derek Cornthwaite, Chicago, Ill., assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 227,607, Feb. 18, 1972, abandoned, which is a continuation of Ser. No. 16,600, March 4, 1970, abandoned. This application July 26, 1974, Ser. No. 492,206

Int. Cl.[2] B01J *21/04*

U.S. Cl. 252—463 9 Claims

1. A methanol synthesis catalyst precursor comprising copper oxide in an amount such that said precursor comprises 10–80% copper with the balance essentially a spinel structure support comprising the oxides of zinc and aluminum, said precursor being characterized by the presence of spinel in crystallites not larger than 120 Angstrom units.

3,923,695

CATALYST FOR MANUFACTURING HIGHLY PURIFIED 2-HYDROXY-DIPHENYL CATALYST AND METHOD OF PREPARING CATALYST

Oskar Weissel, Krefeld-Bockum; Josef Metten, Krefeld; Hans Helmut Schwarz, Krefeld-Bockum; Horst Koller, and Peter Tacke, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 289,119, Sept. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 184,872, Sept. 29, 1971, abandoned. This application Feb. 13, 1974, Ser. No. 442,156

Claims priority, application Germany, Oct. 10, 1970, 2049809; Jan. 20, 1971, 2102476

Int. Cl. B01j *11/06, 11/22*

U.S. Cl. 252—465 7 Claims

1. A process for manufacturing a catalyst which comprises the steps of

a. preparing a catalyst base composition by

I. treating an aqueous solution containing a nickel salt, a chromium salt, an aluminum salt and a copper salt with an aqueous solution of a precipitant selected from the group consisting of sodium hydroxide, ammonia, alkali metal carbonate and alkali metal bicarbonate or

II. precipitating an aqueous solution containing a nickel salt, an aluminum salt and a copper salt with an alkali metal carbonate and reacting the precipitated carbonate-hydroxide mixture, after washing, with ammonium bichromate at elevated temperature,

whereby the amounts are selected to give a nickel metal to chromium metal to aluminum metal to copper metal weight ratio of 40–60 to 6.8–17.1 to 1.6–8.0 to 0.05–1.0;

b. impregnating said catalyst base composition with at least one member selected from the group consisting of alkali metal sulfate and alkali metal carbonate to obtain an alkali metal to nickel metal weight ratio of 0.65–3.4 to 40–60;

c. shaping said catalyst base composition either before or after said impregnation into a molding having a bulk density of 0.8–1.6 g/ml;

d. reducing impregnated catalyst molding at a temperature between 350° and 420°C. for about 1 to 4 hours with about one-half to twice the equivalent amount of hydrogen calculated for reducing nickel compounds present to metallic nickel and any chromium VI compounds present to trivalent chromium and

e. subsequently further reducing said moldings, at a temperature between 350° and 420°C. for about 1 to 4 hours, with with 2to 10 times the equivalent amount of hydrogen for reducing nickel compounds present to metallic nickel until the metallic nickel content of the composition is 10–45% by weight.

3,923,696

CATALYST STRUCTURE

John Edward Chart, Warwick, N.Y., and Burton Bower Knapp, Allendale, N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Aug. 22, 1973, Ser. No. 390,424

Int. Cl.[2] B01J *23/16, 23/64, 23/84*

U.S. Cl. 252—467 5 Claims

1. In a catalyst particularly adapted for use in abatement of noxious materials in automotive exhaust, adapted to operate at high temperatures in the range of up to about 930°C. and higher in the presence of one or more of oxygen, nitrogen, nitrogen oxides and products of combustion of hydrocarbon fuel and comprising a structure having a surface catalytically active to reduce nitrogen oxides to its elements or to oxidize carbon monoxide and unburned hydrocarbons to final oxidation products and an underlying metallic base selected from the group consisting of formable, workable steel, chromium steel, stainless steel, chromium-containing nickel base alloys and other non-ferrous metals having a melting point in excess

of the temperatures encountered in automotive exhaust manifolds, the improvement comprising a layer of chromium oxide interposed between said catalytically active surface and said metallic base to inhibit reaction of said metallic base with said oxygen, nitrogen, nitrogen oxides and products of combustion of said hydrocarbon fuel at said high temperatures.

3,923,697

ELECTRICALLY CONDUCTIVE COMPOSITIONS AND THEIR USE

Harold Ellis, P.O. Box 2158, Ocean View Branch, Miami Beach, Fla. 33140

Filed Feb. 1, 1974, Ser. No. 438,824
Int. Cl.[2] H01B *1/06*
U.S. Cl. 252—506 **12 Claims**

1. An electrically conductive composition comprising a particulate, homogeneous blend of:

A. about 60 to about 98% by weight of graphite,

B. about 1.5 to about 20% by weight of manganese dioxide, and

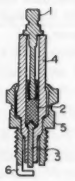
C. about 0.5 to about 20% by weight of zinc oxide, each of said percentages based on the total weight of said blend.

3,923,698

RESISTORS FOR IGNITION PLUGS

Osami Kamigaito; Hideyuki Masaki; Masami Oki, all of Nagoya; Masatosi Suzuki, Kariya, and Yasuo Nakamura, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd. and Kabushi Kaisha Toyota Chuo Kenkyusho, both of, Japan

Filed Oct. 31, 1973, Ser. No. 411,403
Claims priority, application Japan, Nov. 8, 1972, 47-112363
Int. Cl.[2] H01B *1/08*
U.S. Cl. 252—518 **8 Claims**



1. A resistor consisting essentially of 40 to 90% by weight of resistance material and 10 to 60% by weight of low melting glass, the resistance material comprising 1 to 16% by weight of aluminum oxide, 75.6 to 98% by weight of tin oxide and 0.84 to 9.9% by weight of antimony oxide, the components of said resistance material being adhered together and hardened into coherent solid bodies by said low melting glass.

3,923,699

CYCLOHEXADECENONE-5 PERFUME COMPOSITIONS

Akira Komatsu, Tokyo; Toshio Yoshida, Yokohama; Susumu Akutagawa, Tokyo; Fumitaka Norose, Yokohama; Takeshi Yamamoto, Yokohama, and Ikuji Kumasa, Yokohama, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1971, Ser. No. 213,818
Claims priority, application Japan, Dec. 29, 1970, 45-126904
Int. Cl.[2] A61K *7/46*; C07C *49/44*
U.S. Cl. 252—522 **1 Claim**

1. A perfume composition having a musk-like odor comprising an olfactory amount of cyclohexadecenone-5 in combination with a conventional perfume.

3,923,700

OLIGOMERIC TITANATE OR ZIRCONATE ESTER PERFUME COMPOSITIONS

Brian George Jaggers, Hillsdale, N.J.; Keith Frederick Ufton, Ilford, and Horst Richard Wagner, Ongar, both of England, assignors to Bush Boake Allen Limited, London, England

Division of Ser. No. 158,049, June 29, 1971, Pat. No. 3,849,326. This application Feb. 5, 1974, Ser. No. 439,926
Claims priority, application United Kingdom, July 1, 1970, 31863/70
Int. Cl.[2] A61K *7/00*; C11B *9/00*
U.S. Cl. 252—522 **19 Claims**

1. A compounded perfumery composition comprising a plurality of odoriferous ingredients and at least one compound selected from the group consisting of oligomeric compounds of the formula

$$A_3M(OMA_2)_nA.$$

wherein n is an integer, M is titanium or zirconium and the groups A are the same or different organic groups at least one of which has the formula (—OR), wherein R is the residue of a perfumery alcohol or phenol, said compound having been prepared by hydrolysis of a monomeric titanate of zirconate ester of formula MA_4 with from 50 to 90 moles of water per 100 moles of said monomeric ester; and said perfumery alcohol or phenol is selected from the group consisting of linalol; β-phenyl ethyl alcohol; benzyl alcohol; methanol; n-hexanol; α-terpineol; eugenol; cis-hex-3-en-1-ol; n-nonanol; citronellol; n-decanol; geraniol; nerol; myrcenol; dihydrocitronellol; dihydrolinalol; isoborneol; 2,6-dimethyloctan-8-ol; farnesol; dihydrofarnesol; nerolidol; γ-phenyl-n-propyl alcohol; γ-phenyl-n-butyl alcohol; Σ-phenyl-n-amyl alcohol; cinnamyl alcohol; 2-amyl-cinnamyl alcohol phenylethylene glycol; anisyl alcohol; dimethylbenzyl carbinol; phenylethyldimethyl carbinol; methylphenyl carbinol; dimethylphenyl carbinol; trichloromethyl phenylcarbinol; ethylbenzylcarbinol; methylbenzylcarbinol; isopropylbenzyl carbinol; ethyl-n-amylcarbinol; methyl-n-amyl carbinol; ω-hydroxymethyllogifolene; 6-and 10-hydroxymethyl-1 8-p-methadiane; Σ-camphena carbinol; 2-hydroxy-γ-pinane; verbenol; carveol; 2-hydroxy-6-p-menthene; 5-hydroxy-3-p-menthene; 3-hydroxy-2,5-dimethyl-1,4,6-octatriene; 6,8-dihydroxy-1-p-menthene; 1-hydroxy-2-p-menthene; 4-hydroxy-2-p-menthene; piperitol, carvitol; 3-hydroxy-1,1,2,3-tetramethyl-4-cyclohexane; 3-hydroxy-2-methyl-6-methylene-1,7-octadiene; 1-hydroxy-2-emthyl-6-methylene-2,7-octadiene; 3-hydroxy-2-dimethyl-1,7-octadiene; 1-hydroxy-2-,6-dimethyl-2,6,octadiene; ambrettolide; exaltolide; dihydroambrettolide; vanillin; eugenol; ethylvanillin; homovanillin; isoeugenol; methyl-iso-eugenol; benzyl-iso-eugenol; thymol and p-tert-butylphenol.

3,923,701

CLEANING COMPOSITION FOR INKS, PENCILS AND VARIOUS SOILS

Kenneth G. Rutherford, Windsor, Canada, and Stanley Oriel Howick, Union Lake, Mich., assignors to Howick Chemical, Union Lake, Mich.

Filed July 12, 1972, Ser. No. 271,061
Int. Cl.[2] C11D *3/26, 7/32*
U.S. Cl. 252—544 **2 Claims**

1. A cleaning composition suitable for removing markings left by inks, pencils, and the like,

consisting essentially of in parts by volume:

100 parts of a carrier base material of ethoxylated tall oil fatty acid,

20 parts of dimethyl formamide,

20 parts of tertiary butyl acetate.

3,923,702

CONVERSION OF DISTILLATION RESIDUES TO USEFUL METAL WORKING LUBRICANTS

Robert J. Sturwold; Fred O. Barrett, and Walter E. Utz, all of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Aug. 8, 1974, Ser. No. 495,620

Int. Cl.² C10M *1/24, 3/18, 5/12, 7/20*

U.S. Cl. 252—56 S **10 Claims**

1. A process for converting residues, obtained when fatty acids produced from fat-splitting processes are distilled, to useful lubricants which comprises contacting the residue with a hydroxylic compound containing at least one hydroxyl group and at least four carbon atoms at a temperature above 100°C while removing water from the reaction mixture until the acid value of the product is about 10 or below, the equivalents ratio of said hydroxylic compound to said residue being 1:1 or higher, based on the acid value of the residue.

3,923,703

PROCESS FOR PREPARING PHOTOSENSITIVE POLYMER

Hideo Fukutani, Tokyo; Konoe Miura, Yokohamo; Chihiro Eguchi, Yokohoma; Yoshihiro Takahashi, Yokohama, and Kazuo Torige, Yokohama; all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Feb. 8, 1974, Ser. No. 440,770

Claims priority, application Japan, Mar. 3, 1973, 48-25270

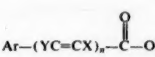
Int. Cl.² C08F *120/22, 114/06, 124/00*

U.S. Cl. 260—2 A **10 Claims**

1. A process for preparing a photosensitive polymer which comprises reacting

a. a polymer having an active halogen atom selected from the group consisting of halogen-containing polyethers, copolymers of halogen-containing polyethers with epoxy compounds, halogen-containing vinyl polymers and acryl polymers;

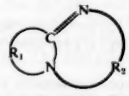
b. with an α,β-unsaturated carboxylic acid having the formula



$$Ar-(YC=CX)_n-\overset{O}{\overset{\|}{C}}-OH$$

wherein X and Y represent a hydrogen atom, a halogen atom, a cyano group or a nitro group; Ar represents an aryl group and n represents an integer of 1 or 2;

c. in the presence of a bicyclic amidine having the formula



wherein R_1 represents a C_{1-11} alkylene group which can be substituted by an inert group and R_2 represents a propylene group which can be substituted by an inert group;

d. in an aprotic polar solvent;

the reaction being carried out in a homogeneous reaction system.

3,923,704

PROCESS FOR MAKING POROUS POLYESTER GRANULES

Raymond Harry Gunning, Box Hill North, and Frederick John Lubbock, Beaumaris, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Filed Sept. 24, 1974, Ser. No. 508,993

Claims priority, application Australia, Oct. 4, 1973, 5101/73

Int. Cl.² C08J *9/00;* **C08L** *67/06*

U.S. Cl. 260—2.5 N **2 Claims**

1. A process of preparing pigmented vesiculated polyester resin granules by

1. forming a dispersion of pigment in water containing a non-flushing pigment dispersing agent,
2. emulsifying the pigment dispersion so-prepared into a solution of a carboxylated unsaturated polyester resin in polymerisable monomer in the presence of a water-soluble polyamine which has a dissociation constant in water (pKa) value of 8.5 – 10.5 and which contains at least three amine groups selected from primary, secondary and tertiary amine groups at a concentration providing 0.3 to 1.4 amine groups per carboxyl group of the unsaturated polyester resin and with sufficient mechanical agitation to reduce the size of the disperse particles to below one micron,
3. dispersing the above emulsion in the form of discrete globules in an aqueous continuous phase comprising a solution in water of a colloidal stabiliser for the dispersion and a water-soluble thickening agent with continuous mechanical agitation, the intensity of which is limited to lie below the threshold at which growth by coalescence of the disperse globules so-formed takes place,
4. initiating and activating co-reaction of the unsaturated polyester resin and polymerisable monomer with simultaneous control of mechanical agitation to a level below the shear rate at which irreversible formation of agglomerates of two or more granules takes place, at least until a sample of the granules is cured sufficiently to be insoluble in methyl ethyl ketone, and
5. continuing agitation until curing of the granules is essentially completed as determined by a maximum free polymerisable monomer level of 0.5% by weight.

3,923,705

METHOD OF PREPARING FIRE RETARDANT SILOXANE FOAMS AND FOAMS PREPARED THEREFROM

Schuyler B. Smith, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 30, 1974, Ser. No. 519,380

Int. Cl.² C08K *3/04, 3/10*

U.S. Cl. 260—2.5 S **48 Claims**

1. A method of preparing an organosiloxane foam comprising mixing an organohydrogensiloxane having an average of at least three silicon-bonded hydrogen atoms per molecule, an average of no more than one silicon-bonded hydrogen atom per silicon atom and organic radicals selected from the group consisting of alkyl radicals having from one to six carbon atoms per radical, phenyl and 3,3,3-trifluoropropyl, a hydroxylated organosiloxane having an average of from greater than 1.0 to 2.5 silicon-bonded hydroxyl radicals per molecule and having an average of at least one organic radical per silicon atom selected from the group consisting of alkyl radicals having from one to six carbon atoms per radical, phenyl and 3,3,3-trifluoropropyl and a platinum catalyst in an amount of from 5 to 200 parts by weight platinum per one million parts by weight total composition, said organohydrogensiloxane and said hydroxylated organosiloxane being present in sufficient amounts to provide a molar ratio of silicon-bonded hydrogen

atoms to silicon-bonded hydroxyl radicals of 2.5 to 40, where a mixture is obtained having a viscosity of less than 100,000 cs. at 25°C., thereafter allowing a foam to form.

3,923,706
PROCESS FOR PREPARING SELF-EXTINGUISHING EXPANDABLE POLYSTYRENE

James J. Uebelhart, Beaver; John P. Spicuzza, Jr., Pittsburgh, and Frank J. E. Mills, Beaver, all of Pa., assignors to Arco Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 377,748, July 9, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,423

Int. Cl.² C08J *9/00*

U.S. Cl. 260—2.5 B **1 Claim**

1. A process for preparing self-extinguishing expandable polystyrene particles comprising the steps of:

a. polymerizing styrene in an aqueous suspension in the presence of a catalytic amount of a free radical initiator until the polymerization has progressed to a point between about 92 and 98% conversion of monomer to polymer;

b. adding a mixture consisting of from about 0.5 to 5.0% by weight based on styrene of pentabromochlorocyclohexane, 5 to 15% of a blowing agent, and 0.3 to 0.5% of free radical initiator;

c. chemically incorporating the pentabromochlorocyclohexane into the growing polymer chains by completing the polymerization in aqueous suspension by heating the suspension under conditions of temperature and time sufficient to completely polymerize the remaining monomer; and

d. recovering the polymer particles.

3,923,707
PROCESS FOR THE PRODUCTION OF POURABLE, PULVERULENT RUBBERS

Gerhard Berg, and Karl-Heinz Nordsiek, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed June 18, 1974, Ser. No. 480,598

Claims priority, application Germany, June 20, 1973, 2331299

Int. Cl.² C08L *1/08, 9/00, 9/08*

U.S. Cl. 260—17 R **11 Claims**

1. A process for preparing discrete, finely divided, tack-free, pourable, powdery filler-free elastomer particles from an aqueous emulsion of an elastomeric polymer having crystalline or thermoplastic block sequences and selected from the group consisting of EPM- or EPDM block sequence copolymers having an ethylene content of 65–80% and a Raman crystallinity of 0.3–1.5 R; copolymers of butadiene with a styrene or α-methylstyrene vinyl aromatic monomer having a molar ratio of butadiene to the vinyl aromatic monomer of 1 : 1 – 1 : 6, 20–100% of the vinyl aromatic monomer being in block sequence form and constituting at least about 20 mol % of the copolymer structure; and stereohomopolymers of butadiene containing 10–30% trans-1,4 double bonds in a stereo block sequence configuration, said aqueous emulsion consisting essentially of (i) a solution containing 4–25% by weight of said elastomer dissolved in a volatile, inert organic solvent having a boiling point below 100° C., (ii) an elastomer emulsifying amount of about 0.05–2% of a surfactant amine derivative and (iii) water, the weight ratio of the aqueous phase to the organic solvent phase of said emulsion being from about 0.25 to 2.5 : 1, which process comprises:

gradually introducing said admixture into an aqueous alkali silicate solution containing 0.5 – 20 moles of SiO_2 per mole of said amine surfactant while maintaining said silicate solution at a pH which destabilizes the surfactant; simultaneously evaporating said volatile organic solvent to form said elastomer particles; and

drying said particles at a temperature below the softening point thereof.

3,923,708
SIZING AGENT FOR GLASS FIBERS

Jun-ichi Furukawa, and Yoshinao Kono, both of Wakayama, Japan, assignors to Kao Soap Co. Ltd., Tokyo, Japan

Filed June 12, 1974, Ser. No. 478,432

Claims priority, application Japan, June 27, 1973, 48-72519

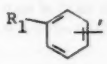
Int. Cl.² C08L *67/08, 67/06*

U.S. Cl. 260—22 R **7 Claims**

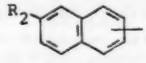
1. In a sizing agent composition for glass fibers comprising a film-forming material, a lubricant for glass fibers, a coupling agent for glass fibers and an antistatic agent, the improvement which comprises employing as the film-forming material an oil-in-water type emulsion of an unsaturated polyester obtained by the reaction of (a) 1 mole of a dibasic acid composition containing at least 50 mole percent of a material selected from the group consisting of fumaric acid, maleic anhydride and mixtures thereof, (b) 1 to 1.5 moles of a diol component containing at least 30 mole percent of an adduct of 2 to 10 moles of an alkylene oxide to bisphenol A with (c) an emulsifier selected from the group consisting of an adduct of 5 to 200 moles of an alkylene oxide to castor oil, an adduct of 5 to 200 moles of an alkylene oxide to hydrogenated castor oil and polyethyleneglycol having an average molecular weight of 1000 to 6000, the amount of said emulsifier (c) being 5 to 30 parts by weight per 100 parts by weight of the sum of the polyester starting materials (a) and (b), and incorporating the resulting unsaturated polyester into water, and employing an antistatic agent of one of the following formulae

$$RSO_3H \cdot N(CH_2CH_2OH)_3 \text{ or}$$
$$ROSO_3H \cdot N(CH_2CH_2OH)_3$$

wherein R is selected from the group consisting of (1) alkyl having 8 to 20 carbon atoms, (2) alkyl benzene radical of the formula

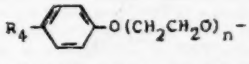


wherein R_1 is alkyl having 8 to 20 carbon atoms, (3) alkylnaphthalene radical of the formula

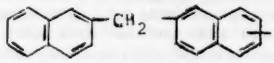


wherein R_2 is alkyl having 1 to 20 carbon atoms, (4) polyoxyethylene alkyl ether radical of the formula $R_3—O(CH_2CH_2O)_n—$,

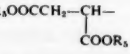
wherein R_3 is alkyl having 8 20 carbon atoms and n is a number from 1 to 200, (5) polyoxyethylene alkyl phenyl radical of the formula



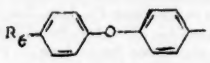
wherein R_4 is alkyl having 8 to 20 carbon atoms, (6) naphthalene-formaldehyde condensate radical of the formula



(7) dialkylsuccinate radical of the formula



wherein R_5 is alkyl having 8 to 20 carbon atoms, and (8) alkyldiphenyl oxide radical of the formula



wherein R_6 is alkyl having 8 to 20 carbon atoms, the composition containing from 1 to 15 parts by weight of said antistatic agent per 100 parts by weight of said emulsion, calculated as the solids.

3,923,709

3,4-DIHYDRO-3-OXO-2H-1,4-BENZOTHIAZINES AND BENZOXAZINES

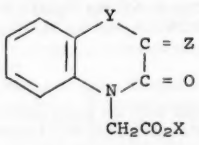
Jimmy W. Worley, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 30, 1974, Ser. No. 502,114

Int. Cl.² C07D *279/14, 265/36*

U.S. Cl. 260—240 K **12 Claims**

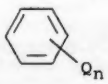
1. A compound of the formula



wherein X is hydrogen or alkyl of up to four carbon atoms, Y is oxygen, sulfur or sulfoxide, and Z is cyclohexylidene, or

wherein R and R′ are each independently hydrogen or lower alkyl, or

wherein R″ is phenyl, styryl, 3,4-methylenedioxyphenyl or



wherein *n* is an integer from one to three, and Q is halogen, nitro, amino, di(lower alkyl)amino, lower alkyl, lower alkoxy, lower alkylthio, hydroxy or trifluoromethyl.

3,923,710

PRODUCTION OF QUINAZOLINONE COMPOUNDS

Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe; Michihiro Yamamoto, Nishinomiya; Masao Koshiba; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

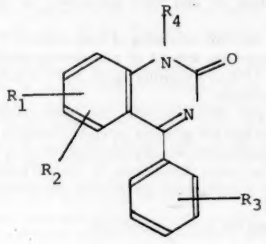
Filed Mar. 29, 1973, Ser. No. 346,037

Claims priority, application Japan, Mar. 31, 1972, 47-32966

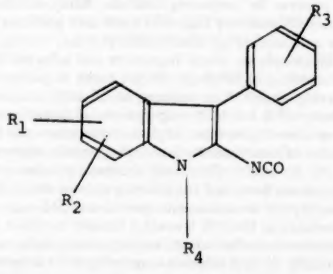
Int. Cl.² C07D *239/82*

U.S. Cl. 260—251 QB **5 Claims**

1. A process for preparing a quinazolinone of the formula,



wherein R_1, R_2 and R_3 are independently a hydrogen atom, a halogen atom, trifluoromethyl, nitro, lower alkyl or lower alkoxy; and R_4 is a hydrogen atom, lower alkyl, benzyl, chlorobenzyl, fluorobenzyl, phenethyl, C_1–C_4 alkoxy-C_1–C_4 alkyl, polyhalo C_1–C_3 alkyl or C_5–C_6 cycloalkyl-C_1–C_4 alkyl, which comprises the step of reacting an indole-2-isocyanate of the formula,



wherein R_1, R_2, R_3 and R_4 are as defined above, in acetic acid with an oxidizing agent selected from the group consisting of ozone-oxygen and chromic acid.

3,923,711

WAX COATING COMPOSITIONS

Edward A. Pullen, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 82,088, Oct. 19, 1970, abandoned. This application Apr. 5, 1972, Ser. No. 241,433

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C08L *91/08*

U.S. Cl. 260—28.5 AV **8 Claims**

1. A method for preparing a wax coating blend having reduced moisture vapor permeability which comprises: dissolving and blending an ethylene-vinyl acetate copolymer and about 0–200 ppm of an antioxidant in molten petroleum wax, and agitating and mixing the molten wax-polymer blend with an oxygen-containing gas for a time insufficient to significantly degrade said wax but sufficient to partially oxidize said polymer, whereby the moisture vapor permeability of the blend is substantially reduced and thereafter adding to the oxidized blend an increment of anti-oxidant.

3,923,712

METAL OXIDE PASTE DISPERSIONS AND USE AS CURING AGENTS

Glenn C. Vickery, Barberton, Ohio, assignor to Basic Incorporated, Cleveland, Ohio

Division of Ser. No. 354,339, April 25, 1973. This application Aug. 15, 1973, Ser. No. 388,580

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C08K *3/22*

U.S. Cl. 260—28.5 B **21 Claims**

1. The process for curing haloprene polymers which comprises incorporating into the polymer stock up to about 12 parts by weight based on 100 parts by weight of polymer, of a paste co-dispersion consisting essentially of from about 50% to about 80% by weight of a mixture of from about 30 to about 80 parts by weight of magnesium oxide and from about 10 to about 60 parts by weight of zinc oxide, the oxides having an average particle size of up to about 10 microns, a non-aqueous liquid vehicle and an oil-soluble or oil-dispersible surface active agent, and heating the mixture to effect curing of the polymer.

3,923,713

NON-YELLOWING TEXTILE ADHESIVE

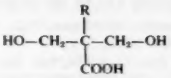
David Trimble Hermann, Montgomery Township, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 275,393, July 26, 1972, abandoned. This application Mar. 8, 1974, Ser. No. 449,314

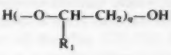
Int. Cl.² C08G *18/12, 18/71*

U.S. Cl. 260—29.2 TN **6 Claims**

1. In a process for preparing a polyurethane adhesive composition in the form of an aqueous dispersion comprising the steps of: forming an isocyanate-terminated prepolymer by reacting tolylene diisocyanate with a mixture of two glycols at a ratio of from 1.6 to 3.0 moles of diisocyanate per mole of total glycol, one of said glycols being a non-polymeric glycol of the formula:



wherein R is hydrogen or lower alkyl, the other of said glycols being a polyalkylene ether glycol of the formula:



wherein R_1 is lower alkyl and q is an integer sufficiently large to provide an average molecular weight of from 750 to 5000, the molar ratio of glycols being 0.25:1 to 2:1 respectively; forming a latex by reacting the isocyanate-terminated prepolymer in aqueous medium containing a tertiary lower alkylamine (C_1–C_3) and allowing chain extension with water to proceed until substantially all of the isocyanate groups have been reacted; and adding a thickening agent to said latex to produce an adhesive of viscosity in the range of from 200 to 150,000 cps, the improvement which comprises:

adding an organic monoisocyanate of an alkyl isocyanate having 10 to 22 carbon atoms in the alkyl chain or a phenyl isocyanate to the latex in an amount effective of prevent yellowing.

3,923,714

GRAFT COPOLYMERS OF POLY (N-VINYL LACTAM) HAVING DIACETONE ACRYLAMIDE AND ACRYLIC ACID ESTERS GRAFTED THEREON

Eugene S. Barabas, Watchung, and Marvin M. Fein, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 6, 1972, Ser. No. 312,477

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C08L *35/00, 39/04*

U.S. Cl. 260—29.6 WB **11 Claims**

1. A graft copolymer of a monomer mixture comprising approximately by weight 5 to 90 percent diacetoneacrylamide and 0 to 85 percent of an ester of acrylic or methacrylic acid graft polymerized on 10 to 95 percent of polymeric N-vinyl lactam as substrate.

3,923,715

AQUEOUS DISPERSIONS OF PERFLUOROALKYL ESTERS AND VINYL POLYMERS FOR TREATING TEXTILES

Robert Harold Dettre, Wilmington, and Edward James Greenwood, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 26, 1973, Ser. No. 382,843

Int. Cl.² C08L *25/06, 31/02*

U.S. Cl. 260—29.6 R **7 Claims**

1. An aqueous dispersion of a composition consisting essentially of more than 0 and up to 95 percent of a nonfluorinated vinyl polymer having an adjusted Vickers Hardness of about 10 to 20, and 5% to less than 100% of a perfluoroalkyl ester of a carboxylic acid of from 3 to 30 carbon atoms, the ester being volatile at about 200°C. to 300°C., the composition forming up to about 60% of the total weight of the dispersion, the nonfluorinated vinyl polymer and the perfluoroalkyl ester amounting to 100% of the composition.

3,923,716

CONTROL OF FUNGAL GROWTH UTILIZING ALUMINUM SALTS OF ACRYLIC ACID

Thomas W. Powanda, Middlesex, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 21, 1974, Ser. No. 435,360
Int. Cl.[2] C08L *23/00*
U.S. Cl. 260—29.6 MM 7 Claims

1. A method for the control of fungi in an emulsion-type latex paint exposed to conditions which promote fungal growth formation which method comprises utilizing in said paint an amount effective to control fungi of an aluminum salt of acrylic acid.

3,923,717

A KILN FEED SLURRY FOR MAKING PORTLAND CEMENT CONTAINING AN INORGANIC SLAT OF A STYRENE-MALEIC ANHYDRIDE COPOLYMER

Robert H. Lalk, and Syamalarao Evani, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 19, 1974, Ser. No. 498,482
Int. Cl.[2] C08K *3/00*; C04B *7/02*, *7/35*
U.S. Cl. 260—29.6 S 12 Claims

1. A kiln feed slurry useful in a wet process to produce portland cement, having a water content of between 25% and 35% by weight and sufficient to render the slurry pumpable, said slurry containing from about .01 to about 0.1 weight % of a monovalent inorganic salt of a copolymer containing from about 33 to about 50 mole % of maleic anhydride and from about 67 to about 50 mol % styrene and a molecular weight of from about 1000 to about 5000.

3,923,718

STYRENE-BUTADIENE ADHESIVE COMPOSITION IN THE FORM OF AN AQUEOUS DISPERSION

Rene Arpin, Lyon, France, assignor to Rhone-Progil, Courbevoie, France

Filed Sept. 17, 1973, Ser. No. 398,094
Claims priority, application France, Sept. 21, 1972, 72.33439
Int. Cl.[2] C08L *25/10*
U.S. Cl. 260—29.7 UA 5 Claims

1. An adhesive composition in the form of a 20–85% by weight aqueous dispersion containing, on the solids basis, 90–10% by weight mineral particles having a dimension within the range of 0.1–120 microns and selected from the group consisting of calcium, magnesium and barium sulphates and carbonates, 10–90% by weight of a mixture of styrene and butadiene copolymer in the form of particles dimensioned within the range of 0.05–10 microns and of at least one hydrosoluble water retainer selected from the group consisting of alkaline metal polyacrylates, hydroxy alkyl cellulose, carboxymethyl ethyl cellulose, polyvinyl alcohol and an alginate, in which the hydrosoluble water retainer is present in the ratio of 1–10 parts by weight of the hydrosoluble water retainer to 15 parts by weight of the copolymer.

3,923,719

RUBBER FORMULATIONS

Marion J. Gattuso, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 197,938, Nov. 11, 1971, abandoned. This application Sept. 24, 1973, Ser. No. 400,293
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C08K *5/36*
U.S. Cl. 260—30.8 R 6 Claims

1. A rubber formulation containing, as an oil extender therein, a styrene distillation column bottoms product obtained by distillation of styrene in the presence of a sulfur polymerization inhibitor, said bottoms product containing as a major portion thereof an organo-sulfur compound.

3,923,720

LUBRICATED THERMOPLASTIC RESIN

Antony W. M. Coaker, and Elmer E. Cowell, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 107,526, Jan. 18, 1971. This application Dec. 6, 1973, Ser. No. 422,380
Int. Cl.[2] C08K *5/10*
U.S. Cl. 260—31.2 R 14 Claims

1. A composition of matter comprising a thermoplastic polycondensation resin and a liquid copolymer of (1) from about 5 to about 95% by weight of an alkylacrylate wherein the alkylradical contains from 1 to about 12 carbon atoms and (2) from about 95 to about 5% by weight of a dissimilar alkylacrylate wherein the alkylradical contains from about 3 to about 24 carbon atoms, wherein the acrylic copolymer is present in amounts of from about 0.001 to 8.0 parts by weight per 100 parts by weight of polycondensation resin.

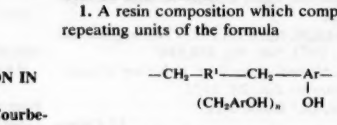
3,923,721

RESIN COMPOSITIONS

Alfred Gerald Edwards, Stourport-on-Severn, and Glyn Islwyn Harris, Hagley, both of England, assignors to Albright & Wilson Limited, Oldbury, England

Filed Jan. 9, 1974, Ser. No. 431,828
Claims priority, application United Kingdom, Jan. 16, 1973, 2311/73; Aug. 14, 1973, 38415/73
Int. Cl.[2] C08K *3/34*, *3/36*; C08L *61/14*
U.S. Cl. 260—32.8 R 13 Claims

1. A resin composition which comprises (a) a resin having repeating units of the formula



Wherein R^1 is a divalent or trivalent aromatic hydrocarbyl or divalent or trivalent aromatic hydrocarbyloxy-aromatic hydrocarbyl, or inertly substituted derivatives thereof, and Ar is a residue formed by removal of 2 nuclear hydrogen atoms from a phenolic compound having a 1–3 hydroxyl groups and at least 2 nuclear hydrogen atoms and n is 0 to 1, and (b) 0.5–100% by weight (based on the weight of the resin) of an inorganic dispersing agent having at least 1 dimension less than 100 mμ and all dimensions less than 15μ and stable to at least 150°C; said inorganic dispersing agent being selected from the group consisting of

i. silica of particle size 3–80 mμ,
ii. asbestos of diameter about 25 mμ and length 5–10 μ,
iii. a mixture of asbestos of diameter about 25 mμ and length 5–10 μ and fumed silica; and
iv. hydrous aluminum silicate of plate-like structure of thickness 2–4 mμ and a maximum dimension of 0.5–1 μ; and

which does not contain a particulate material of particular size 0.2 μ – 20 mm.

3,923,722

ADHESIVE COMPOSITION

Pallavoor R. Lakshmanan, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 29, 1974, Ser. No. 456,165
Int. Cl.[2] C08K *5/07*, *5/01*, *3/26*
U.S. Cl. 260—32.8 A 7 Claims

1. An adhesive composition consisting essentially of a styrene-butadiene block copolymer, a tackifier, calcium carbonate and a solvent wherein the components thereof are present in the following ranges, assuming the presence of 100 parts by weight of the styrene-butadiene component in the final composition:

Component	Weight Per Cent
[Styrene-Butadiene Block Copolymer]	[100]
Tackifier	20–125
Calcium Carbonate	60–500
Solvent	85–1500

, with the styrene-butadiene block copolymer having the following general configuration:

$$A-B-A,$$

wherein A is a styrene polymer block having an average molecular weight of about 5,000 to about 125,000 and B is a butadiene polymer block having an average molecular weight of about 15,000 to about 250,000, the calcium carbonate having an average diameter of about 0.2×10^4 A. to about 50×10^4 A., and the solvent being selected from the group consisting of aromatic hydrocarbons having from six to eight carbon atoms, aliphatic hydrocarbons having from six to eight carbon atoms and ketones having from two to four carbon atoms boiling between about 60° to about 145°C.

3,923,723

PROCESS FOR ENHANCING THE DISPERSION STABILITY OF NONAQUEOUS DISPERSIONS

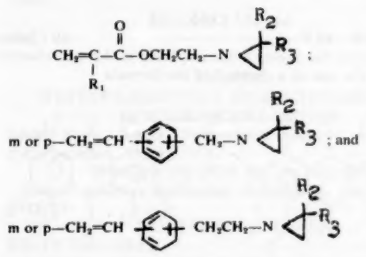
Dieter Heinrich Klein, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 24, 1972, Ser. No. 246,875

Int. Cl.² C08J *3/08*; **C08K** *5/01*; **C08L** *23/00, 25/00*

U.S. Cl. 260—33.6 UA **2 Claims**

1. A process for enhancing the dispersion stability of nonaqueous dispersions, said process comprising dispersing in a nonpolar hydrocarbon diluent a polymeric composition consisting essentially of (I) a side chain, insoluble in said diluent, which side chain is a polymer of a mixture of at least one ethylenically unsaturated monomer which contains a proton donor or proton acceptor group with minor amounts of a monomer selected from the group consisting of trimethylamine methacrylamide; 1,1-dimethyl-1-(2-hydroxypropyl) amine methacrylimide; 1,1-dimethyl-1-(2,3-dihydroxypropyl) amine methacrylimide; methylol acrylamide, and methylol methacrylamide said side chain being present in an amount equal to about 10 to 65 percent of total dispersion volume and (II) a backbone soluble in organic media, comprising a stabilizer which is the product of the reaction of (IIA) a poly-12-hydroxy stearic acid having a molecular weight up to about 3000 and (IIB) a compound selected from the group consisting of compounds of the formula



where

R_1 is hydrogen or CH_3,

R_2 is hydrogen or lower alkyl, and

R_3 is hydrogen or lower alkyl; and wherein the mass ratio of (IIA) to (IIB) is from about 90:10 to about 80:20 said stabilizer being present in an amount of from about 1 to 10 percent by weight of (I).

3,923,724

PROCESSES FOR IMPROVING THE PROCESSING CHARACTERISTICS OF VULCANIZED ELASTOMERS

Hermann Westlinning, Kleinostheim; Siegfried Wolff, Bruehl-Cologne, and Werner Schwarze, Frankfurt, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

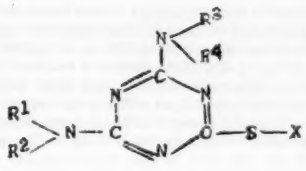
Continuation-in-part of Ser. No. 122,190, March 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 715,541, March 25, 1968, abandoned. This application May 15, 1974, Ser. No. 470,032

Claims priority, application Germany, Mar. 23, 1967, 1669954

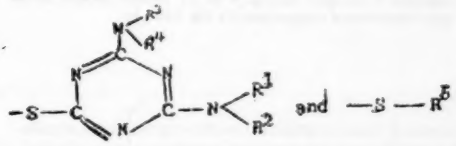
Int. Cl.² C08K *3/04, 3/20, 5/01, 5/34*

U.S. Cl. 260—33.6 AQ **13 Claims**

1. A process for producing a vulcanized elastomeric composition which includes a filler and has improved processing characteristics which process comprises vulcanizing a vulcanizable composition containing, (a) at least one halogen-free elastomer of the group consisting of natural rubber, polyisoprenes, polybutadienes, copolymers of butadiene and styrene, copolymers of butadiene and acrylonitrile, copolymers of isoprene and isobutene, copolymers of butadiene and isobutene, terpolymers of ethylene, propylene and dienes, mixtures of the said elastomers with each other, and oil-extended elastomers of the said elastomers, (b) at least one reinforcing filler, (c) sulfur, and (d) at least one vulcanizing agent consisting of a substituted sym-triazinyl disulfide having the formula



in which formula R^1, R^2, R^3 and R^4 are each a radical of the group consisting of hydrogen, phenyl, alkyl radicals containing up to 18 carbon atoms, alkenyl radicals containing up to 6 carbon atoms, cycloalkyl radicals containing at least 5 and at most 7 carbon atoms, aralkyl radicals containing at least 7 and at most 9 carbon atoms, and the said alkyl, alkenyl, cycloalkyl, phenyl and alkyl radicals that are further substituted with a radical of the group consisting of hydroxyl, cyano and alkoxy radicals containing up to 18 carbon atoms, and X is a radical of the group consisting of



in which formulae R^1, R^2, R^3 and R^4 each have the same significance as hereinbefore and R^5 is a radical of the group consisting of phenyl, benzothiazolyl, carbazolyl, phenothiazinyl, alkyl radicals containing up to 18 carbon atoms, and aralkyl radicals containing at least 7 and at most 9 carbon atoms, or a mixture of one or more of the said substituted sym-triazinyl disulfides in an amount between 0.1 and 50 millimols per 100 grams of the elastomer.

3,923,725

METHOD FOR FORMING EPOXY RESIN PRODUCTS

Kenzo Kadotani; Tatuo Honda, and Tokio Isogai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

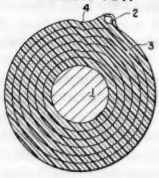
Filed Sept. 29, 1972, Ser. No. 293,378

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

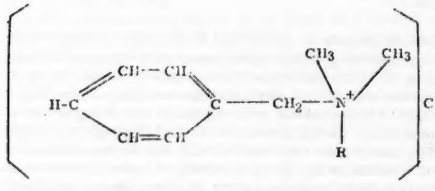
Int. Cl.[2] C08K *9/04*

U.S. Cl. 260—37 EP **19 Claims**

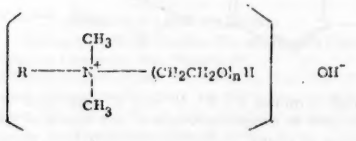
PRIOR ART



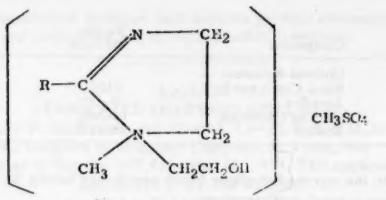
1. A method for manufacturing a formed epoxy resin article comprising inorganic or organic filler materials or structural elements by using an acid anhydride as a hardener which comprises arranging said filler materials or structural elements in a desired configuration treating said filler materials or structural elements so arranged with a quaternary ammonium salt selected from the group consisting of an alkyldimethylbenzyl ammonium chloride represented by the formula:



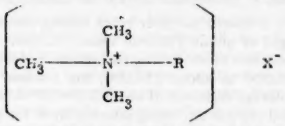
wherein R is alkyl having 8 to 18 carbon atoms, an alkylaminoethanol represented by the formula:



wherein R is alkyl having 9 to 18 carbon atoms and *n* is an integer of from 1 to 3, an alkylaminosulfonate represented by the formula:



wherein R is alkyl having 2 to 11 carbon atoms, and an alkyltrimethyl ammonium salt represented by the formula:



wherein R is alkyl having 8 to 18 carbon atoms and X is chloine or bromine, impregnating the treated filler materials or structural elements with a liquid epoxy resin containing two or more epoxy groups in each molecule said liquid epoxy resin including said acid anhydride, and curing said epoxy resin by heating.

3,923,726

PROCESS OF MAKING COLORED HIGH TEMPERATURE POLYMERS

Gerhard Benz, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 9, 1969, Ser. No. 831,751

Int. Cl.[2] B28B *3/20;* **C08J** *3/22;* **C08L** *67/00, 77/00*

U.S. Cl. 260—40 R **1 Claim**

1. A process of forming an oriented film having a visually uniform coloring by coextruding a film consisting essentially of a normally uncolored, relatively high melting, difficulty colorable, thermoplastic polymer selected from the group consisting of polyesters, polysulfones and polyamides with a minor amount of a uniformly colored, lower softening easily colorable thermoplastic additive polymer selected from the group consisting of polyethylene, polypropylene, polystyrene, and acrylonitrile-butadiene-styrene copolymers, whereby the colored additive polymer is uniformly dispersed throughout the difficultly colorable polymer, and thereafter orienting said film.

3,923,727

PROCESS FOR DYEING THERMOPLASTICS IN THE MELT

Max Jost, Oberwil, and Arnold Wick, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

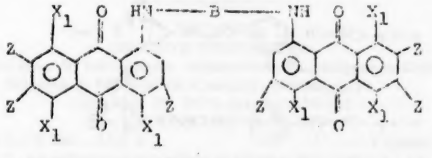
Filed Aug. 20, 1973, Ser. No. 389,909

Claims priority, application Switzerland, Aug. 29, 1972, 12753/72

Int. Cl.[2] C08K *5/08*

U.S. Cl. 260—40 P **10 Claims**

1. A process for dyeing a thermoplastic in the melt characterised by the use of a dyestuff of the formula



wherein B is a carbocyclic or heterocyclic aromatic radical in which the imino groups are directed bonded to a benzene ring, one X_1 denotes H hydroxyl, alkoxy, arylmercapto, arylamino, benzthiazolylmercapto or acylamino and the other X_1 denotes H, one Z denotes H or chlorine and the other Z denotes H.

3,923,728

FLAME-RETARDANT AND SELF-EXTINGUISHING MOLDING COMPOSITIONS

Wolfgang Seydl, Frankenthal, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 24, 1973, Ser. No. 400,177

Claims priority, application Germany, Sept. 28, 1972, 2,247,652

Int. Cl.[2] C08K 3/22, 5/02, 7/12

U.S. Cl. 260—40 R 6 Claims

1. Molding compositions based on polybutylene terephthalate which are flame-retardant and self-extinquishing and do not drip during and after flaming, and which comprise

A. 5 to 30% by weight of a Diels-Alder adduct of 2 moles of hexachlorocyclopentadiene and either 1 mole of cyclopentadiene, furan, dicycopentadiene, 1,5-cycloоctadiene or dicyclo-(2,2,1)-heptadiene,

B. 1 to 15% by weight of a metal compound having synergistic action and,

C. 1 to 10% by weight of a natural silicate, the percentages by weight of components A, B and C being relative to the amount of polyester used.

3,923,729

BIODEGRADABLE TRANSPLANTER CONTAINERS

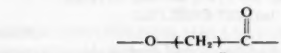
Robert A. Clendinning, New Providence; James E. Potts, Millington, and Walter D. Niegisch, Watchung, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 275,975, July 28, 1972, abandoned. This application July 15, 1974, Ser. No. 488,470

Int. Cl.[2] A01C 1/02; C08G 63/02

U.S. Cl. 260—40 R 22 Claims

1. An article of manufacture which comprises: (a) a biodegradable container fabricated from a mixture of substances comprising (i) from about 5 to about 95 weight percent of biodegradable thermoplastic oxyalkanoyl polymer, said polymer having a reduced viscosity value of at least about 0.1 and upwards to about 12 and being further characterized in that at least about 10 weight percent of said thermoplastic oxyalkanoyl polymer is attributable to recurring oxyalkanoyl units of the formula



wherein x is an integer having a value of 2 to 7, with the proviso that x does not equal 3; (ii) from about 5 to about 95 weight percent of naturally occurring biodegradable product, based on the weight of said container; and (iii) >0 to about 75 weight percent of ingredients of the group consisting of plastic additives, fillers, and mixtures thereof and (b) a medium to germinate and grow seeds or seedlings in said container.

3,923,730

WEATHER-RESISTANT PIGMENTED METALLIC ACRYLIC RESIN LACQUER

Andre Pugin, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,267

Claims priority, application Switzerland, Feb. 28, 1973, 2918/73

Int. Cl.[2] C08K 3/08, 5/34

U.S. Cl. 260—42.21 2 Claims

1. Weather-resistant pigmented metallic acrylic resin lacquer containing a phthalocyanine pigment, aluminium and an acrylic resin, characterised in that it contains nickel-phthalocyanine as the phthalocyanine pigment wherein the ratio of nickel-phthalocyanine to aluminum is between 5:95 and 95:5% by weight.

3,923,731

PRESSURELESS CURING OF FILLED ETHYLENE CONTAINING POLYMERIC COMPOSITIONS

Burton Thornley MacKenzie, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 21, 1973, Ser. No. 372,084

Int. Cl.[2] C08K 3/34, 5/14

U.S. Cl. 260—42.42 17 Claims

1. A method of curing a polymeric composition comprising polymerized ethylene and mineral filler, to a relatively dense and substantially nonporous cured product without the application of high pressure during curing, comprising the steps of:

a. preparing a curable polymeric composition by mixing the ingredients thereof comprising: an ethylene-containing polymer, mineral filler in an amount of at least about 15 parts by weight per 100 parts of the polymer, peroxide curing agent, and at least one organic titanate selected from the group consisting of tetrakis (2-ethylhexyl) titanate, tetrabutyl titanate, and a mixed alkyl titanate comprising about 85 parts isopropyl C_3 by weight and about 15 parts stearyl C_{18} by weight in an amount of about 2 to 10 parts by weight per 100 parts of mineral filler; and,

b. heating the prepared curable polymeric composition under substantially ambient atmospheric pressure conditions and thereby curing said polymeric composition to a relatively dense and substantially non-porous cured product.

3,923,732

PREPARATION OF A MIXTURE OF POLYISOCYANATES BY PHOSGENATING A SLURRY OF A MIXTURE OF POLYAMINES

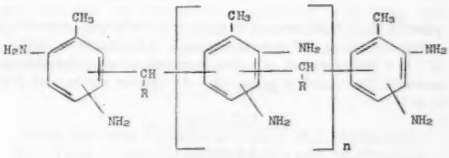
Ehrenfried H. Kober, Hamden; George Rozsa, New Haven, and Wilhelm J. Schnabel, Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 492,865, Oct. 4, 1965, Pat. No. 3,488,374. This application July 18, 1969, Ser. No. 855,440

Int. Cl.[2] C07C 118/02

U.S. Cl. 260—453 PH 1 Claim

1. A method for preparing a mixture of polyisocyanates which comprises reacting phosgene with a slurry comprising a mixture of polyamines of the formula:



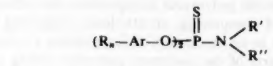
wherein n is an integer of from 0 to about 10 and R is selected from the group consisting of hydrogen and alkyl of from 1 to 5 inclusive carbon atoms, and o-dichlorobenzene and recovering the polyisocyanate product formed, the said reaction being conducted at a temperature of from about 100° to 200°C., the amount of phosgene employed being at least 50 percent in excess of the theoretical amount required to convert each $-NH_2$ group in the starting polyamines into an —NCO group, and the slurry containing from about 4 to about 20 weight percent of said polyamines based on the total weight of the slurry.

3,923,733
POLYOLEFIN LIGHT STABILIZERS

Richard Spector, Kendall Park, and Joseph Anthony Stretanski, Clinton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 13, 1973, Ser. No. 351,043
Int. Cl.² C08K *5/49, 5/51*
U.S. Cl. 260—45.8 NE **21 Claims**

1. A polyolefin stabilized against the deteriorating effects of light having incorporated therein an effective amount of a stabilizer of the formula:



wherein:

R is hydrogen, alkyl of 1-12 carbons, or halogen;

Ar is phenyl or naphthyl;

n is 1 or 2; and

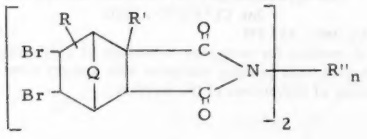
R′ and R″ are each selected from the group consisting of hydrogen, alkyl of 1-18 carbons, 2,2,6,6-tetramethyl-4-piperidyl, cycloalkyl of 5–6 carbons, or both, together with the N, form a heterocyclic ring selected from morpholino or piperidino.

3,923,734
FLAME-RETARDANT COMPOSITIONS

Anderson O. Dotson, Jr., Somerset; Jack Newcombe, and Lionel T. Wolford, both of Freehold, all of N.J., assignors to Cities Service Oil Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 200,615, Nov. 19, 1971, abandoned. This application May 11, 1973, Ser. No. 359,282The portion of the term of this patent subsequent to Jan. 15, 1991, has been disclaimed.
Int. Cl.² C08K *3/22, 5/34, 5/35*
U.S. Cl. 260—45.75 B **9 Claims**

1. A composition comprising (A) a normally flammable organic polymer, (B) antimony trioxide, and (C) a flame retardant having a bromine content of at least about 35% and corresponding to the formula:



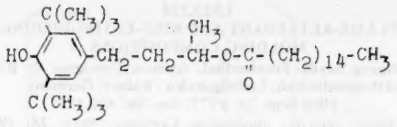
wherein Q is methylene or oxygen, R is hydrogen or an alkyl group containing 1–5 carbon atoms, R′ is hydrogen or methyl, R″ is a halogenated or unhalogenated (cyclo)aliphatic or aromatic hydrocarbon group of 1–15 carbon atoms, and *n* is 0 or 1.

3,923,735
PROCESS FOR STABILIZING POLYAMIDES

Karl Schlichting, Bobenheim-Roxheim; Peter Horn; Johannes Schlag, both of Ludwigshafen, and Wolfgang Koernig, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 444,414, Feb. 21, 1974. This application Sept. 11, 1972, Ser. No. 504,872
Claims priority, application Germany, Feb. 24, 1973, 2309435
Int. Cl.² C08K *9/02*
U.S. Cl. 260—45.85 R **2 Claims**

1. A process for stabilizing polyamides against oxidation and thermal degradation which comprises adding thereto 0.01 to 2% by weight, based on the polyamide, of the compound



3,923,736
ROOM TEMPERATURE VULCANIZABLE ORGANOPOLYSILOXANES

Siegfried Nitzsche; Paul Hittmair; Ernst Wohlfarth, and Eckhart Louis, all of Burghausen, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

Continuation of Ser. No. 234,367, March 13, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 397,027
Claims priority, application Germany, Mar. 16, 1971, 2112522
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C08G *77/04*
U.S. Cl. 260—46.5 G **20 Claims**

1. A room temperature vulcanizable composition which is obtained by admixing in the substantial absence of moisture an essentially linear diorganopolysiloxane having terminal groups which are capable of condensing with an amino-substituted silicon compound selected from the class consisting of silanes, silazanes and siloxanes having at least three silicon-bonded amino groups of the formula $=NCH(CH_3)C_2H_5$ per molecule, said amino-substituted silicon compound is present in an amount of at least 1 mol per gram equivalent of the terminal groups capable of condensation present in the diorganopolysiloxane.

3,923,737
ANAEROBIC ADHESIVES

Harold M. George, Leeds; Keith Hargreaves, Huby, and Paul Wainwright, Horsforth, all of England, assignors to Rocol Limited, England

Filed Mar. 15, 1973, Ser. No. 341,740
Int. Cl.² C08F *7/02*
U.S. Cl. 260—47 UA **6 Claims**

1. A liquid anaerobically curable composition comprising: a polymerizable acrylate ester monomer selected from the group consisting of di-acrylate and di-methacrylate esters of an alkoxylated member selected from the group consisting of ethoxylated bisphenol A, propoxylated bisphenol A, ethoxylated bisphenol C and propoxylated bisphenol C; p-menthane hydroperoxide in an amount sufficient to initiate polymerization of said monomer; 2-amino pyridine in an amount sufficient to accelerate polymerization of said monomer, the amounts of said initiator and accelerator being such that the composition is stable in air but sets when excluded from air.

3,923,738
PROCESS FOR THE FORMATION OF POLYPHENYLENE ETHERS OF CONTROLLED PARTICLE SIZE

Bernardus J. Van Sorge, Ravena, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed July 23, 1974, Ser. No. 490,940
Int. Cl.² C08G *65/46*
U.S. Cl. 260—47 ET **20 Claims**

1. In a process for receiving a polyphenylene ether from a solution thereof in an aromatic solvent by mixing said solution with a non-solvent for said polyphenylene ether in an amount sufficient to cause separation of the polyphenylene ether therefrom, the improvement which comprises using as said non-solvent a medium selected from the group consisting of (i) water and a (lower) alkyl alcohol, (ii) water and a (lower) alkyl ketone, and (iii) water and a mixture of a (lower) alkyl

alcohol and a (lower) alkyl ketone which is also capable of forming a two-phase system with the aromatic solvent and an aromatic solvent selected from the group consisting of benzene, toluene, the xylenes, ethyltoluene, chlorobenzene, dichlorobenzene, nitrobenzene and bromobenzene.

3,923,739

LINEAR β-HYDROXY-ESTER, β-HYDROXY-ETHER AND β-HYDROXY-AMINE POLYMERS

Kurt A. Kurka, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 802,264, Feb. 25, 1969, abandoned. This application July 21, 1971, Ser. No. 164,956

Int. Cl.² C08G *63/20, 63/46, 65/00, 73/00*

U.S. Cl. 260—47 EP **7 Claims**

1. A flexible, soluble, fusible, primarily aliphatic linear polymer containing recurring β-hydroxy-ester, β-hydroxy-ether and/or β-hydroxy-amine linkages in its skeletal chain, some segments of which include at least 20 members between adjacent hydroxyl groups, counting as one member each ring and each atom of any linear chain in the segment and excluding the carbons to which the hydroxyls are attached, said polymer having an inherent viscosity of at least 0.2, a hydroxyl number of about 25–250, and being substantially free from ethylenic unsaturation in the skeletal chain and from oxirane oxygen and active hydrogen other than in its hydroxyl groups through which it can be crosslinked to an insoluble, infusible, still flexible, heat-resistant, state, and any ether oxygens in the skeletal chain are substantially all attached to cyclic carbon.

3,923,740

NOVEL COMPOSITIONS FOR USE IN PROSTHODONTIA

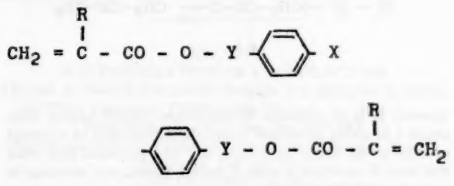
Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum, and Wolf Dieter Zahler, both of Hechendorf, all of Germany, assignors to ESPE Fabrik Pharamzeutischer Praparate GmbH, Germany

Continuation of Ser. No. 824,702, May 14, 1969, abandoned. This application July 31, 1972, Ser. No. 276,334

Int. Cl.² C08F *3/62;* **A61K** *5/00;* **C08F** *29/50*

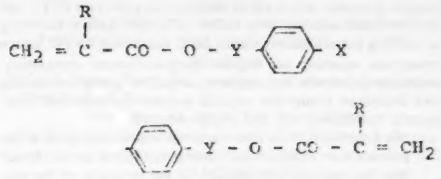
U.S. Cl. 260—47 UA **23 Claims**

1. A method of preparing an artificial denture which comprises disposing in the configuration of said artificial denture and then polymerizing at least one essentially pure compound of the formula



wherein R is hydrogen or methyl, X is an alkylidene or the —SO_2— group, Y is an oxyalklene group of 2–5 carbon atoms or an alkylidene group of 1–5 carbon atoms.

14. A method of preparing a dental filling which comprises depositing in a cavity in a tooth and then polymerizing at least one essentially pure compound of the formula



wherein R is hydrogen or methyl, X is an alkylidene or the —SO_2— group, Y is an oxyalkylene group of 2–5 carbon atoms or an alkylidene group of 1–5 carbon atoms.

3,923,741

ACRYLAMID AQUEOUS SOLUTION REFINING PROCESS

Shiro Asano, Yokohama; Kiyotaka Yoshimura, Mobara; Ryoji Tsuchiya, Kamakura, and Tadatoshi Honda, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 5, 1972, Ser. No. 312,337

Claims priority, application Japan, Dec. 6, 1971, 46-97891; Dec. 6, 1971, 46-97892; Dec. 6, 1971, 46-97893

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 N **5 Claims**

1. A process for refining an acrylamide aqueous solution comprising treating said acrylamide aqueous solution with active carbon, said active carbon having been treated previously so as to have at least 0.05 parts by weight of cupric ion per 100 parts by weight of said active carbon.

3,923,742

PROCESS FOR THE PRODUCTION OF POLYCARBOXYLATES HAVING IMPROVED BIOLOGICAL DEGRADABILITY

Heinz Haschke, Grunaustrasse 17, and Gerhard Morlock, Wildaustrasse 3, both of 6454 Grossauheim, Germany

Filed Nov. 11, 1974, Ser. No. 522,979

Claims priority, application Germany, Nov. 15, 1973, 2357036

Int. Cl.² C08G *20/06, 16/34;* **C02C** *1/40*

U.S. Cl. 260—67 UA **26 Claims**

1. An improved process for the preparation of a polycarboxylate by the oxidative polymerization of acrolein or acrolein and acrylic acid, said polycarboxylate having improved biological degradability, said process comprising slowly adding acrolein monomer or an acrolein-acrylic acid monomer mixture to a heated, moving aqueous hydrogen peroxide solution, wherein the improvement comprises conducting said polymerization in the presence of about 0.1 to about 10% by weight of thioethylene glycol, related to the weight of monomer or monomer mixture.

3,923,743

PROCESS FOR CROSS-LINKABLE PULVERULENT COATING COMPOSITIONS BASED ON URETDIONE POLYISOCYANATES

Bernd Quiring, Leverkusen; Kuno Wagner, Leverkusen-Steinbuechel; Richard Müller, Bergisch-Neukirchen, and Peter Müller, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Feb. 28, 1974, Ser. No. 446,857

Claims priority, application Germany, Mar. 13, 1973, 2312391

Int. Cl.² C08G *18/06;* **B05B** *5/02*

U.S. Cl. 260—75 NT **5 Claims**

1. A process for the production of a branched polyurethane or polyurethane urea polyaddition product having free OH groups and a molecular weight in the range of 1100 to 3000 which is stable in storage and suitable for use as a binder for

lacquer powders which set at temperatures above 110°C , can be converted into powders below 50°C and have a softening or melting point between about 50°C and about 180°C, which comprises reacting an organic polyisocyanate containing uretdione groups or a mixture of uretdione group-containing and uretdione group-free organic polyisocyanates with compounds containing free OH groups wherein

a. the functionality of the reactants which take part in the polyaddition reaction and their proportions are so chosen that the average functionality of the products of the process, based on the reactive end groups in the products, is between about 3.8 and 4.5,

b. the components which take part in the reaction are used in quantities corresponding to an equivalent ratio of hydroxyl groups:isocyanate groups of between about 1.07:1 and about 2.5:1, and

c. the quantity of polyisocyanate which contains a uretdione group in the reaction mixture is sufficient to provide about 0.6% to 25% by weight of uretdione groups.

3,923,744

POLYOLS CONTAINING KETAL GROUPS AND POLYURETHANES PREPARED THEREFROM

Marius Walter Sorenson, Lake Jackson; Ross Clinton Whiteside, Jr., Angleton, and Richard Allan Hickner, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1973, Ser. No. 363,205

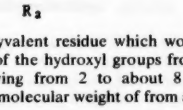
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08G *18/32*

U.S. Cl. 260—77.5 AP **12 Claims**

1. Curable compositions which comprise

A. a capped polyol represented by the formula



wherein Z is the polyvalent residue which would result from the removal of the hydroxyl groups from an uncapped polyol having from 2 to about 8 hydroxyl groups, an average molecular weight of from about 260 to about 3,000;

wherein R_3 is a hydrocarbon group having from 1 to about 6 carbon atoms and each R_1 and R_2 is independently hydrogen, a hydrocarbon group having from 1 to about 6 carbon atoms and R_1 and R_2 can collectively be the group $—CH_2—CH_2—CH_2—CH_2-$, x has a value of from 2 to about 8, and

B. an organic polyisocyanate in proportions so as to provide an NCO:hydroxyl group ratio contained in the uncapped polyol of from about 0.7:1 to about 1.4:1.

3,923,745

WATER-DISPERSIBLE THERMOSETTABLE CATIONIC RESINS AND PAPER SIZED THEREWITH

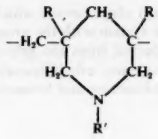
David H. Dumas, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 31, 1973, Ser. No. 393,689

Int. Cl.[2] C08F *8/08*; **C08G** *18/04*, *69/48*; **C08F** *126/04*

U.S. Cl. 260—77.5 CR **6 Claims**

1. A water-insoluble, water-dispersible thermosettable cationic resin derived by reacting (I) an epihalohydrin and (II) a water-insoluble modified diallylamine polymer derived by reaction of (a) a diallylamine polymer consisting essentially of units of the formula



where R is hydrogen or a C_1–C_4 alkyl and R′ is hydrogen, methyl, or ethyl and of the number of R's present in the polymer from 100% to 5% thereof are hydrogen and from 95% to 0% thereof are methyl or ethyl, and (b) a hydrophobizing compound selected from the group consisting of acyl halides, acid anhydrides, ketene dimers, and organic isocyanates, said hydrophobizing compound having a total of from about 12 to about 40 carbon atoms, the said modified diallylamine polymer having at least about 50% amine functionality, said reaction of (a) and (b) being carried out under a nitrogen blanket at a reaction temperature of from about 0°C. to about 100°C. and a pH of about 6 to 8, the amount of epihalohydrin employed being that amount sufficient to react with substantially all the amine functionalities of the water-insoluble modified diallylamine polymer.

3,923,746

ONE-PACKAGE POLYURETHANE COATINGS

Benny Gene Barron, and Russell Henry Cramm, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1973, Ser. No. 416,710

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08G *18/32*

U.S. Cl. 260—77.5 AP **10 Claims**

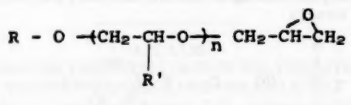
1. A one-package polyurethane coating comprising

A. an NCO-containing prepolymer which is the reaction product of

1. A polyol resulting from the reaction of

a. a polyhydroxyl-containing initiator compound containing from 2 to about 4 hydroxyl groups or a mixture of such compounds, with

b. from about 1 to about 3 moles per hydroxyl group contained in (A–1–a) of a glycidyl ether selected from glycidyl ethers represented by the general formula



wherein R is an aliphatic hydrocarbon radical having from about 4 to about 10 carbon atoms, R′ is hydrogen or a methyl or ethyl group and n has a value of 0 to 2 provided that when n is zero, R contains at least 6 carbon atoms, and mixtures of such glycidyl ethers; with

2. an organic diisocyanate in quantities so as to provide an NCO:OH ratio of from about 1.5:1 to about 2:1;

B. optionally, as a viscosity reducing component, from 0 to about 50 percent by weight of an organic hydrocarbon solvent, and

C. a catalytic quantity of a catalyst for urethane formation.

3,923,747

POLY(CAPROLACTONE)BASED POLYURETHANES HAVING IMPROVED BLOCKING CHARACTERISTICS

Edmond G. Kolycheck, Lorain, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 23, 1973, Ser. No. 418,551
Int. Cl.² C08G *18/42, 18/61*
U.S. Cl. 260—77.5 AN 5 Claims

1. A polyurethane comprising the reaction product of a hydroxy-terminated polyester of a dicarboxylic acid and a glycol, said polyester having a molecular weight in the range of about 600 to 1200, a poly(epsilon-caprolacetone)diol having a molecular weight from about 400 to 600, an aliphatic diol containing about 5 to 10 carbon atoms, all when mixed together having a blend average molecular weight of between about 350 to 500, from about 0.005 to about 0.5 mol of hydroxyl-terminated dimethylpolysiloxane having a molecular weight in the range of about 500 to about 3000, a $D_{20/4}$ of about 1 and containing about 2 to 4 weight percent hydroxyl groups per mol of polyester and an acyclic or alicyclic diisocyanate containing greater than 6 carbon atoms present in amounts substantially equivalent to the hydroxyl-terminated materials.

3,923,748

MERCAPTAN TERMINATED POLYMERS AND METHOD THEREFOR

Jack W. Hutt, Encino, and Hakam Singh, Newhall, both of Calif., assignors to Products Research & Chemical Corporation, Burbank, Calif.

Continuation-in-part of Ser. No. 414,653, Nov. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 239,730, March 30, 1972, abandoned. This application July 22, 1974, Ser. No. 490,244
Int. Cl.² C08G *18/04*
U.S. Cl. 260—77.5 CR 12 Claims

1. A method of producing mercaptan terminated liquid polymers curable to solid polysulfides, said liquid polymers having from two to four terminal mercaptan groups which comprises:

forming a reaction admixture consisting essentially of (1) a liquid polymer reactant having two to four terminal reactive olefinic double bonds, (2) an initiating effective amount of alkaline initiator having a pK_b value of 6.0 or less and no aryl groups, and (3) a sulfur containing reactant selected from the group consisting of an organic compound having from two to three terminal mercaptan groups, a liquid polymer having from two to three terminal mercaptan groups, and hydrogen sulfide, the ratio of sulfur containing reactant to liquid polymer reactant being about 1 mole of sulfur containing compound for each olefin equivalent of liquid polymer; heating at a temperature between room temperature and the boiling point of the reactants substantially in the absence of nitrogen until reaction is complete as indicated by the disappearance of the olefinic double bonds.

3,923,749

POLYMERIZATION OF CAPROLACTAM

Thomas J. Howell, Cornwells Heights, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 10, 1972, Ser. No. 279,583
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C08G *69/14*
U.S. Cl. 260—78 L 4 Claims

1. The method of producing a fiber-forming polymer which comprises melt polymerizing caprolactam with a dilithium salt of unsubstituted 3,5-disulfobenzoic acid moiety in a reactor in the ratio of 20 to 45 millimoles of salt per kilogram of caprolactam.

3,923,750

PROCESS FOR PREPARING WHOLLY AROMATIC POLYAMIDES IN THE PRESENCE OF AN ARYL SULFONE

Rufus S. Jones, Dover, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 14, 1973, Ser. No. 360,208
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C08G *69/28*
U.S. Cl. 260—78 R 10 Claims

1. A method for preparing high molecular weight wholly carbocyclic aromatic polyamides comprising heating in the substantial absence of oxygen a carbocyclic aromatic dicarboxylic acid and a carbocyclic aromatic diamine in about a mole to mole ratio in the presence of an aryl sulfone to a temperature above the melting point of said sulfone to just below the decomposition temperature of the reactants, and continuing said heating with the removal of condensation by-products for a time sufficient to form a polymer having an inherent viscosity of at least 0.4 as measured using a solution of 0.4 grams of product per 100 milliliters of concentrated aqueous sulfuric acid, 97–99 percent by weight, at 25°C., said aryl sulfone being present in an amount corresponding to 100 to 2500 weight percent of the polymer.

3,923,751

PROCESS FOR PREPARING POLYAMINO ACID IN A NON-POLAR SOLVENT

Yuji Iwashita, Kawasaki, and Mitsuru Sakuraba, Tokyo, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 427,695
Claims priority, application Japan, Dec. 26, 1972, 48-3170; Aug. 23, 1973, 48-94583
Int. Cl.² C08G *69/10*
U.S. Cl. 260—78 A 5 Claims

1. In a process for preparing a polyamino acid by polymerizing an α-amino acid halide salt selected from the group consisting of an α-amino acid chloride hydrochloride and an α-amino acid bromide hydrobromide, the improvement which comprises:

polymerizing said α-amino acid halide salt in a non-polar organic solvent which contains no active hydrogen atoms in the absence of a base at elevated temperatures such that said polyamino acid is obtained having an intrinsic viscosity above 0.4.

3,923,752

PRESSURE SENSITIVE ADHESIVES FROM DIESTERS OF FUMARIC ACID AND VINYL COMPOUNDS COPOLYMERIZABLE THEREWITH

Gunter Güse, and Hanns Georg Pietsch, both of Hamburg, Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 276,927, Aug. 1, 1972, Pat. No. 3,880,873, which is a division of Ser. No. 60,629, Aug. 3, 1970, Pat. No. 3,690,937. This application Oct. 9, 1974, Ser. No. 513,237
Claims priority, application Germany, Aug. 8, 1969, 1940549
Int. Cl.² C08F *22/06, 218/14*
U.S. Cl. 260—78.5 E 1 Claim

1. A pressure-sensitive adhesive material of an adhesive composition adhering on contact which comprises a copolymer formed from the polymerization of a monomer mixture of (A) 50–80% by weight, based on the total weight of the monomers, of at least one diester of fumaric acid and a saturated monovalent aliphatic alcohol containing from 3 to 12 carbon atoms; (B) 18–40% by weight, based on the total weight of the monomers, of at least one vinyl ester of a saturated aliphatic monocarboxylic acid copolymerizable with (A); (C) from 0.5 to 15% by weight, based on the total weight of the monomers, of maleic acid anhydride having a polar group copolymerizable with (A) and (B), and (D) from 0.1 to 10% by weight,

based on the total weight of the monomers, of N-methylolacrylamide copolymerizable with (A), (B) and (C), said compound having a self cross-linkable N-methylolamide group, said group of (D) being at least partially cross-linked.

3,923,753

1,4-DIHYDRONAPHTHALENE DERIVATIVES

David J. Fenoglio, Carol Stream, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Jan. 14, 1973, Ser. No. 432,996
Int. Cl.[2] C07D *327/00*; C08G *75/00*
U.S. Cl. 260—79 3 Claims

1. 2,3-thioepoxytetralin.
2. Poly (2,3-thioepoxytetralin).

3,923,754

CURING OF LIQUID POLYTHIOPOLYMERCAPTAN POLYMERS

Michael A. Pellico, Los Angeles, Calif., assignor to Denton Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 414,893, Nov. 12, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,378
Int. Cl.[2] C08G *75/00*
U.S. Cl. 260—79 12 Claims

1. A method of curing a liquid organic polythiopolymercaptan polymer at ambient temperature within a time span not exceeding about 15 minutes which comprises interacting the polymer at ambient temperature with

a. at least 20 parts by weight of a zinc constituent selected from the class of zinc oxide, zinc peroxide and mixtures thereof, and

b. at least 20 parts by weight of a polysulfide constituent selected from the class of alkyl thiuram polysulfide, benzothiazyl disulfide and mixtures thereof,

with the amount of each of the zinc and polysulfide constituents being based upon about 100 parts, by weight, of the polymer.

3,923,755

AMINE SULFONATES AS DYE SITES IN SUSPENSION POLYMERS

Robert Albert Piloni, Pottstown, Pa., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 230,966, March 1, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 452,892
Int. Cl.[2] C08F *15/40*, *15/02*
U.S. Cl. 260—79.3 MU 6 Claims

1. Process of Copolymerizing

in an aqueous suspension system in which the monomers are suspended as globules in an aqueous medium

in the presence of a free-radical initiator which is soluble in the mixture (I) specified hereinbelow

said aqueous medium containing a colloidal-type suspending agent

		Parts by Weight
(I)	A mixture of 90–10 parts of acrylonitrile with 10–90 parts of vinyl chloride	100
with		
(II)	an amine sulfonate salt monomer which is a salt of	0.1 – 10.0

II-a. an anionic moiety which is 2-acrylamido-2-methylpropane sulfonic acid

with

II-b. a cationic moiety which is a higher-alkyl-group-containing primary, secondary or tertiary amino compound, wherein the alkyl group or groups contain a total of 12–30 carbon atoms

whereby to produce a cationic-dye-receptive polymeric product.

3,923,756

THIN FILM CATALYTIC POLYMERIZATION OF WATER-IN-OIL EMULSIONS OF WATER-SOLUBLE ETHYLENICALLY UNSATURATED AMIDE MONOMERS

Jerry J. Svarz, La Grange, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 23, 1974, Ser. No. 535,988
Int. Cl.[2] C08F *2/32*, *120/56*, *220/06*
U.S. Cl. 260—80.3 N 9 Claims

1. In the continuous catalytic emulsion polymerization or co-polymerization of water-soluble ethylenically unsaturated amide monomers alone or in the presence of acrylic acid or alkyl-substituted acrylic acid while flowing in a thin layer, the steps which comprise: feeding a mixture of water-in-oil emulsion of water-soluble ethylenically unsaturated amide monomer and polymerization catalyst therefor into a heat exchanger having a reaction chamber of uniformly narrow cross section formed between opposing surfaces at least one of which provides a heat transfer surface of substantial area; flowing said mixture through said reaction chamber while said heat transfer surface area thereof is maintained within plus or minus 3°C. of a predetermined polymerization or co-polymerization temperature; and, maintaining said reaction chamber and said mixture flowing therethrough, substantially free of oxygen.

3,923,757

TRANSPARENT ADHESIVE

Ival O. Salyer; Philip H. Wilken, both of Dayton, and George L. Ball, III, West Carrollton, all of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation of Ser. No. 211,642, Dec. 23, 1971, abandoned. This application Oct. 18, 1973, Ser. No. 407,714
Int. Cl.[2] B32B *27/36*, *17/06*; C08F *15/10*, *15/40*
U.S. Cl. 260—80.75 2 Claims

1. An optically clear adhesive for glass-glass, glass-polycarbonate and polycarbonate-polycarbonate laminates which comprises an ethylene/vinyl acetate copolymer having from about 40 to about 65 weight percent vinyl acetate, said copolymer being partially hydrolyzed in a mineral acid medium to form a terpolymer having a vinyl alcohol content from about 3 to about 30 weight percent, said terpolymer being compounded and partially cross-linked with from about 0.5 to about 3.0 weight percent of a diacyl peroxide.

3,923,758

SUBSTANTIALLY HEXANE SOLUBLE PROPYLENE/BUTENE-1 COPOLYMER CONTAINING 30 TO 75 WEIGHT PERCENT BUTENE-1

Edward H. Carter, Jr., Kingsport, Tenn., and Robert E. Holliday, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 2, 1973, Ser. No. 376,077
Int. Cl.[2] C08F *10/06*, *10/08*, *4/64*
U.S. Cl. 260—88.2 8 Claims

2. A solution process according to claim 1 wherein said trialkyl aluminum is triethyl aluminum.

3,923,759

PROCESS FOR THE PREPARATION OF ISOBUTYLENE/BETA-PINENE COPOLYMERS

Joseph P. Kennedy, Akron, Ohio, and Tom M. Chou, Los Angeles, Calif., assignors to The University of Akron, Akron, Ohio

Filed Nov. 9, 1973, Ser. No. 414,337
Int. Cl.[2] C08F *210/00*
U.S. Cl. 260—88.2 7 Claims

2. A process for the azeotropic copolymerization of isobutylene and beta-pinene as in claim 1, wherein said solvent is selected from the class consisting of methyl chloride, ethyl chloride, methylene chloride, chlorobenzene, 1,2-dichloroe-

thane, propane, pentane, hexane, toluene, cyclohexane, carbon disulfide and mixtures thereof.

3,923,760

COLOR IMPROVEMENT PROCESS FOR POLYOLEFINS

Richard V. Mullikin, Texas City, and Morris R. Ort, Seabrook, both of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 3, 1973, Ser. No. 421,455
Int. Cl.[2] C08F *6/00*
U.S. Cl. 260—88.2 R 8 Claims

1. The method of improving the color of an olefin polymer or copolymer having a vanadium content from about 3 to about 25 parts per million parts by weight of polymer and prepared by polymerization of an alpha-olefin alone or in combination with other olefins in contact with a Ziegler catalyst comprising a vanadium compound which consists of intimately contacting said polymer in the molten state with an alkanol having 2 to 4 carbon atoms in an amount from about 0.05 to about 5.0% by weight of the polymer and from about 10 to about 500 parts by weight per million parts by weight based on the polymer of a weak base selected from the group consisting of the oxides, hydroxides and carbonates of metals of Group II of the Periodic Table and thereafter removing all of said alkanol as a vapor from said polymer.

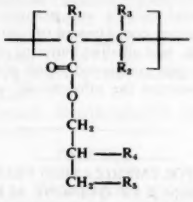
3,923,761

PHOTOPOLYMERS

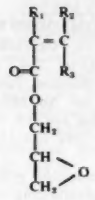
Edward H. Parker, Ballwin; Edward M. Harris, Webster Groves, and Jim D. Meador, Bridgeton, all of Mo., assignors to Western Litho Plate & Supply Co., St. Louis, Mo.

Division of Ser. No. 272,796, July 18, 1972, Pat. No. 3,852,256. This application Feb. 1, 1974, Ser. No. 438,599
Int. Cl.[2] C08F *124/00, 126/06, 128/06, 134/00*
U.S. Cl. 260—88.3 A 6 Claims

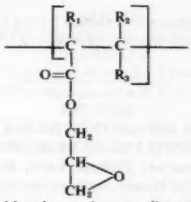
1. A process for producing a light-sensitive polymer susceptible to crosslinking on exposure to actinic light, containing at least about 10% by weight of the light-sensitive recurring unit:



wherein R_1, R_2, and R_3 are each selected from the group consisting of hydrogen, halogen, and lower alkyl and at least one of R_4 and R_5 is selected from the group consisting of azidobenzoyloxy and azidonaphthoyloxy, the other of R_4 and R_5 being selected from the group consisting of hydroxy, halogen, alkoxy, aryloxy, aralkoxy, alkoxyalkoxy, aryloxyalkoxy, alkoxyaryloxy, aryloxyaryloxy, alkylacyloxy, arylacyloxy, alkenylacyloxy, aralkenylacyloxy, heterocyclic substituted acyloxy, azidobenzoyloxy and azidonaphthoyloxy, the process comprising: preparing a mixture containing a monomer having the structure:



wherein R_1, R_2, and R_3 are as defined above, and a polymerization initiator under an inert atmosphere; polymerizing said monomer to produce a polymer intermediate containing the precursor recurring unit:



and esterifying said polymer intermediate with a compound selected from the group consisting of azidobenzoic acid, azidonaphthoic acid, azidobenzoyl halide and azidonaphthoyl halide, in the presence of a catalyst for the esterification, the proportion of said precursor recurring unit in said polymer intermediate and the extent of esterification being sufficient that the product of the esterification contains at least about 10% by weight of said light-sensitive recurring unit.

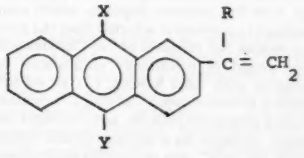
3,923,762

PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND POLYMERS

Milan Stolka, Fairport; James M. Pearson, Webster, and John F. Yanus, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 417,317, Nov. 19, 1974. This application Feb. 25, 1974, Ser. No. 445,705
Int. Cl.[2] C07C *67/00, 25/26*; C08F *112/00*
U.S. Cl. 260—89.5 6 Claims

1. An anthracenic polymer segment consisting essentially of the addition product of at least one monomer of the formula



wherein R is hydrogen or alkyl of 1 to about 3 carbon atoms; and X and Y are independently selected from chlorine, bromine, alkyl of 1 – 4 carbon atoms, or phenyl said segment having a degree of polymerization of about 40 or greater.

3,923,763
NOVEL SULFUR COMPOUND MODIFIERS FOR CHLOROPRENE POLYMERIZATION

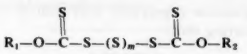
Morris S. Edmondson, Alvin, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 289,521, Sept. 15, 1972, abandoned. This application Jan. 15, 1975, Ser. No. 541,237

Int. Cl.[2] C08F *136/16, 4/00*

U.S. Cl. 260—92.3 **4 Claims**

1. A process for the emulsion polymerization of chloroprene which comprises polymerizing chloroprene in the presence of from about 0.05 to 5 parts by weight per 100 parts of polymerizable monomer of a modifier having the formula



wherein R_1 is a hydrocarbon radical having from 1 to 8 carbon atoms, R_2 is a hydrocarbon radical having 1 to 8 carbon atoms and m is 1 to 4.

3,923,764
ADJUVANT FOR IMPROVING THE POLYMERISATION OF ETHYLENE-HYDROCARBONS

Henri Fassy, Jurancon; Philippe Lalet, Orthez, and Andre Miletto, Pau, all of France, assignors to Societe Anonyme Ato Chimie, Paris, France

Filed Dec. 11, 1972, Ser. No. 314,255

Claims priority, application France, Dec. 9, 1971, 71.44175

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08F *2/02, 4/40, 14/06*

U.S. Cl. 260—92.8 R **12 Claims**

1. In a process of polymerizing an ethylene hydrocarbon or vinyl chloride employing a redox catalyst, wherein one component of said redox catalyst is a hydroperoxide, organic peracid or mixture thereof and the other component is SO_2 or an SO_2 liberating compound, the improvement which comprises additionally employing an adjuvant selected from the group consisting of alkali metal amide, alkaline earth metal amide, alkali metal amido-sulfinate, alkaline earth metal amido-sulfinate, ammonium sulfite, and mixtures thereof.

3,923,765
PROCESS FOR SUSPENSION POLYMERIZATION OF VINYL HALIDES WITH LOW POLYMER DEPOSITION

Ulrich Goetze, Cologne Bocklemund; Axel Wole, Cologne-Longerich; Gottfried Nettesheim, Pulheim; Thomas Balwe, Burghausen; Johann Bauer, Burghausen; Kurt Fendel, Burghausen; Dieter Kurz, Burghausen, and Alex Sabel, Burghausen, all of Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

Filed Mar. 7, 1973, Ser. No. 338,840

Claims priority, application Germany, Oct. 4, 1972, 2248607

Int. Cl.[2] C08F *114/02, 114/16*

U.S. Cl. 260—92.8 W **6 Claims**

1. In the suspension polymerization process for the production of polymerizates containing at least 70 percent of polyvinyl halides, with low polymer deposits, which comprises the steps of mixing (1) monomers selected from the group consisting of vinyl halides and mixtures of vinyl halides with up to 30 percent by weight of olefinically unsaturated compounds copolymerizable with vinyl halides, (2) an oil-soluble free-radical-forming polymerization catalyst, (3) suspension stabilizers including protective colloids, and (4) water, heating said mixture under agitation to a polymerization temperature of between 30°C and 80°C, and recovering said polymerizate, of the improvement which consists of conducting said polymerization in the presence of from 10 to 300 ppm, based on the water content, of water-soluble reducing agents, in a reactor whose inner surface has a mean peak-to-valley height of at most 1 μ and where the flow velocity adjacent said inner surface is at least 0.3 m/sec., whereby a polymerizate is recovered substantially without polymer deposits.

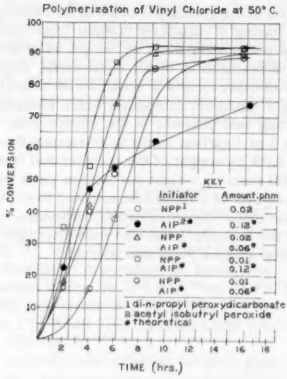
3,923,766
POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMER

James A. Barter, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

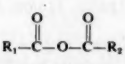
Continuation-in-part of Ser. No. 284,025, Aug. 28, 1972, abandoned, and Ser. No. 385,787, Aug. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 284,024, Aug. 28, 1972, abandoned. This application June 3, 1974, Ser. No. 476,117

Int. Cl.[2] C08F *2/02, 2/16, 4/30, 4/32*

U.S. Cl. 260—92.8 R **62 Claims**



1. In the process for polymerizing ethylenically unsaturated material susceptible to polymerization with free-radical type initiators in an aqueous or bulk polymerization medium, the improvement which comprises conducting said polymerization in the presence of an initiator system comprising, in combination, alkaline buffering reagent, organic acid anhydride represented by the general formula,



wherein R_1 and R_2 are each selected from the group consisting of substituted and unsubstituted C_1–C_{20} alkyl, C_6–C_{10} cycloalkyl and C_6–C_{10} aryl radicals, and peroxygen compound selected from the group consisting of organic peroxy acid and hydrogen peroxide, said alkaline buffering reagent, acid anhydride and peroxygen compound being present in amounts sufficient to polymerize the ethylenically unsaturated material.

3,923,767
ETHYLENE POLYMERIZATION PROCESS IN THE PRESENCE OF QUINONE ALKIDES

Gene E. Kellum, and Ronald E. Gilbert, both of Orange, Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

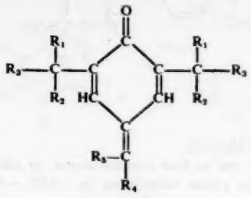
Filed Aug. 22, 1974, Ser. No. 499,398

Int. Cl.[2] C08F *110/02;* **C07C** *49/62, 97/18*

U.S. Cl. 260—94.9 R **3 Claims**

1. In a continuous high pressure, free-radical initiated, mass process for preparing ethylene polymers; the improvement which consists essentially of feeding a quinone alkide to the polymerization zone in a minor amount sufficient to improve the optical properties of the ethylene polymer being pro-

duced, said quinone alkide having the formula:



where R_1 and R_2 are alkyl groups, R_3 is an alkyl group or an aryl group, and R_4 and R_5 are hydrogen or an alkyl group.

3,923,768
TREATMENT OF TALL OIL FATTY ACIDS

John R. Powers, and Frances M. Miller, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,664
Int. Cl.² C09F *1/00*
U.S. Cl. 260—97.5 **2 Claims**

1. A process for disproportionating tall oil fatty acids containing less than 5 percent rosin acids which comprises,

heating said tall oil fatty acids at a temperature between 250°F. and 430°F. in the presence of from at least 0.2 to about 1.0 percent by weight of said tall oil fatty acids of iodine for from 30 minutes to 2.5 hours to convert the linoleic acid present in the fatty acids to oleic acid.

3,923,769
[N-ME-ILE′,ILE⁸]-ANGIOTENSIN II AS AN ANGIOTENSIN ANTAGONIST

Francis Merlin Bumpus, 75 Winterberry Lane, Chagrin Falls, Ohio 44022; Mahesh Chandra Khosla, 7415 Warwick Lane, Chesterland, Ohio 44026, and Robert Rudolph Smeby, 36801 Riviera Road, Willoughby, Ohio 44094

Filed May 10, 1974, Ser. No. 468,831
Int. Cl.² C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 **1 Claim**

1. The octapeptide L-(N-methyl)Ile-L-Arg-L-Val-L-Tyr-L-Ile-L-His-L-Pro-L-Ile.

3,923,770
[ME₂GLY¹, ILE⁸]-ANZIOTENSIN II AS AN ANGIOTENSIN ANTAGONIST

Francis Merlin Bumpus, 75 Winterberry Lane, Chagrin Falls, Ohio 44022; Mahesh Chandra Khosla, 7415 Warwick Lane, Chesterland, Ohio 44026, and Robert Rudolph Smeby, 36801 Riviera Road, Willoughby, Ohio 44094

Filed May 10, 1974, Ser. No. 468,832
Int. Cl.² C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 **1 Claim**

1. The octapeptide dimethylglycyl-L-Arg-L-Val-L-Tyr-L-Ile-L-His-L-Pro-L-Ile.

3,923,771
N-GUANIDYLACETYL-[DES-ASP¹-ILE⁸] ANGIOTENSIN II AS AN ANGIOTENSIN ANTAGONIST

Francis Merlin Bumpus, 75 Winterberry Lane, Chagrin Falls, Ohio 44022; Mahesh Chandra Khosla, 7415 Warwick Lane, Chesterland, Ohio 44026, and Robert Rudolph Smeby, 36801 Riviera Road, Willoughby, Ohio 44094

Filed May 10, 1974, Ser. No. 468,854
Int. Cl.² C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **1 Claim**

1. The octapeptide quanidylacetyl-L-Arg-L-Val-L-Tyr-L-Ile-L-His-L-Pro-L-Ile.

3,923,772
(1-α-AMINOISOBUTYRIC ACID)-CORTICOTROPIN PEPTIDES

Hideo Otsuka, Mino, and Ken Inouye, Kobe, both of Japan, assignors to Shionogi & Company, Ltd., Japan

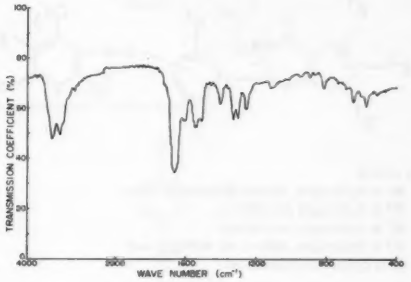
Continuation-in-part of Ser. No. 124,549, March 15, 1971, Pat. No. 3,873,511. This application May 14, 1974, Ser. No. 469,890
Claims priority, application Japan, Mar. 16, 1970, 45-22190; May 7, 1970, 45-38878
Int. Cl.² C07C *103/52;* **A61K** *37/40*
U.S. Cl. 260—112.5 **2 Claims**

1. The compound α-aminoisobutyryl-L-tyrosyl-L-seryl-L-methionyl-L-glutamyl-L-histidyl-L-phenylalanyl-L-arginyl-L-tryptophyl-glycyl-L-lysyl-L-prolyl-L-valylglycyl-L-lysyl-L-lysyl-L-lysyl-L-lysine amide.

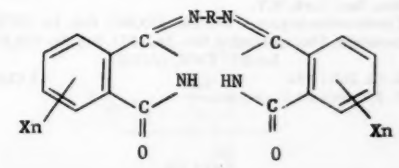
3,923,773
METHOD FOR PREPARING ISOINDOLENONE PIGMENTS

Hirohito Ando, Urawa, and Kunihiko Takagi, Tokyo, both of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Apr. 25, 1973, Ser. No. 354,194
Int. Cl.² C07D *209/50;* **C09B** *57/00;* **C07C** *103/76*
U.S. Cl. 260—152 **8 Claims**

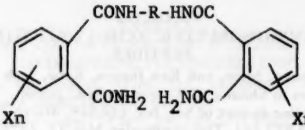


1. A method of preparing an isoindolenone pigment of the formula



wherein X is a halogen atom, *n* is a number from 0 to 4, and R is a direct bond, or divalent residue of one of the group consisting of o-, m-, p-phenylenediamines, benzidine, o-dianisidine, o-, m-tolidines, 3,3′-dichlorobenzidine, 4,4′-diaminodiphenyl methane, 3,3′-dichloro-4,4′-diaminodiphenyl methane, 4,4′-diaminodiphenyl ether, 1,5-diaminonaphthalene, 2,2′-diaminodiphenyl, 2,6-diaminotoluene, 2,6-diaminopyridine, 2,6-diaminobenzothiazole, diaminoazobenzene, N-(p′-aminophenyl)p-aminobenzamide, or 2,2′-dichlorobenzidine;

comprising the step of condensing a compound of the formula



wherein X, *n*, and R are as defined above, at a temperature of from 60° to 130°C. and in the presence of both an inert organic solvent and at least 2 mols per mol of the above compound of a condensing agent.

3,923,774

QUINAZOLONE CONTAINING PHENYL-AZO-PYRIDINE COMPOUNDS

Peter Dimroth, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 4, 1973, Ser. No. 348,083

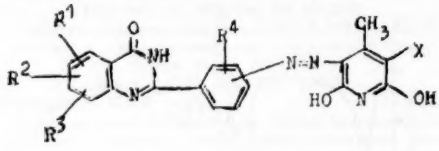
Claims priority, application Germany, Apr. 20, 1972, 2219169

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C09B *29/36*

U.S. Cl. 260—154 **4 Claims**

1. A quinazolone azo pigment of the formula



in which:

R^1 is hydrogen, chloro, bromo or nitro;
R^2 is hydrogen or chloro;
R^3 is hydrogen or chioro;
R^4 is hydrogen, chloro or methyl; and
X is cyano or carbamoyl.

3,923,775

8,8-DIOXO-6,6-AZOPURINE AND METHOD FOR PREPARING THE SAME

Joseph R. Davis, Chicago, Ill., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 333,043, Feb. 16, 1973, abandoned. This application Nov. 26, 1973, Ser. No. 418,877

Int. Cl.² C07C *107/00*

U.S. Cl. 260—154 **3 Claims**

1. 8,8′-dioxo-6,6′-azopurine.

3,923,776

MONOAZO DYE FROM AN AMINOBENZENE CARBOXYLIC ESTER DIAZO COMPONENT AND A PYRIDONE COUPLING COMPONENT

Gerhard Gnad, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

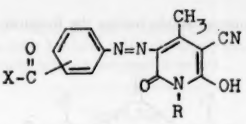
Division of Ser. No. 25,253, April 2, 1970, abandoned. This application Sept. 20, 1972, Ser. No. 290,708

Claims priority, application Germany, Apr. 3, 1969, 1917278

Int. Cl.² C09B *29/36*

U.S. Cl. 260—156 **3 Claims**

1. An azo dye of the formula



where

X is $(OCH_2CH_2)_nOZ$,
R is alkyl of one to four carbon atoms, or alkyl of two to four carbon atoms substituted by —OH, $—OCH_3$ or $—OC_2H_5$,
n is 2 or 3 and
Z is alkyl of one to four carbon atoms.

3,923,777

AZO DYE FROM AN ORTHO-OXYDIAZOLYLANILINE DIAZO COMPONENT

Peter Dimroth, and Ernst Schaffner, both of Ludwigshafen, Germany, assignors to Badische-Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

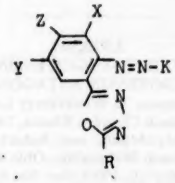
Filed July 5, 1973, Ser. No. 376,565

Claims priority, application Germany, July 10, 1972, 2233871

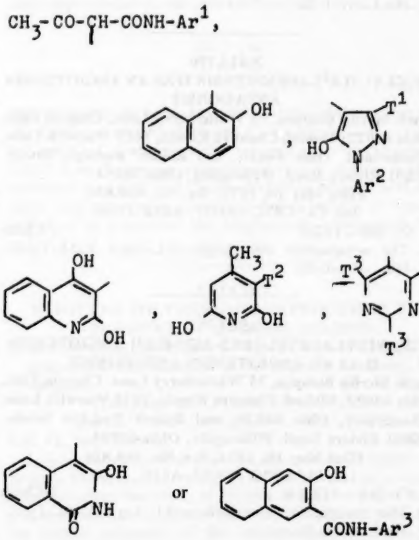
Int. Cl.² C09B *29/20*

U.S. Cl. 260—157 **5 Claims**

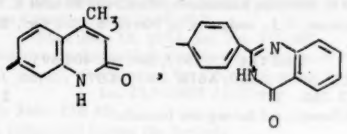
1. An azo dye of the formula



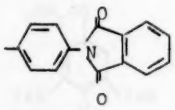
in which K is



Ar^1 is phenyl or phenyl substituted by chloro, methoxy, ethoxy, methyl,



or



Ar^2 is phenyl or phenyl substituted by chloro or methyl, Ar^3 is phenyl, phenyl substituted by chloro, methoxy, methyl, phenylaminocarbonyl, chlorophenyl-aminocarbonyl, dichlorophenylaminocarbonyl, phthaloylaminophenylaminocarbonyl, anthraquinonylaminocarbonyl, benzoylaminophenylaminocarbonyl, sulfonylphenylaminocarbonyl, N-(phenylsulfamoyl- or N-chlorophenylsulfamoyl)-phenylaminocarbonyl, phthaloylaminobenzoylamino, chlorobenzoylamino, phenylaminooxalylamino, anthraquinonylcarbonylamino or ethylphenylaminocarbonyl or naphthyl,
T^1 is methyl or carbamoyl,
T^2 is cyano or carbamoyl,
R is phenyl, phenyl substituted by chloro, bromo, methyl, methoxy, cyano, nitro, phenyl, sulfamoyl, N-phenylsulfamoyl, phenylsulfonyl, acetylamino, benzoylamino or dichlorobenzoylamino, naphthyl or anthraquinonyl,
X is hydrogen or chloro
Y is hydrogen, chloro or nitro and
Z is hydrogen or nitro.

3,923,778

DISAZO DYESTUFFS CONTAINING THE α:β-DICHLORO- OR α:β-DIBROMOPROPIONYLAMINO GROUP

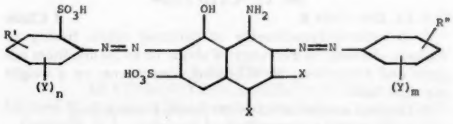
Rene de Montmollin, Riehen, and Henri Riat, Arlesheim, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Division of Ser. No. 876,069, Nov. 12, 1969, Pat. No. 3,755,290, which is a continuation-in-part of Ser. No. 753,829, July 22, 1968, abandoned, which is a continuation of Ser. No. 608,710, Nov. 1, 1966, abandoned, which is a division of Ser. No. 305,539, Aug. 29, 1963, abandoned, which is a conth uation-in-part of Ser. No. 731,097, April 28, 1958, abandoned. This application June 1, 1972, Ser. No. 258,773

Int. Cl.² C09B *62/00, 62/04;* **D06P** *3/66*

U.S. Cl. 260—174 **5 Claims**

1. A disazo dyestuff of the formula



wherein R′ represents hydrogen, lower alkyl, lower alkoxy, trifuloromethyl, chlorine or bromine,

One X is hydrogen and the other X is the sulphonic acid group,

R″ is hydrogen, lower alkyl, lower alkoxy, trifluoromethyl, chlorine, bromine, sulfo or nitro,

Y is α:β-dichloropropionylamino or α:β-dibromopropionylamino,

***n* is 0 or 1**

***m* is 0 or 1**

the total of $n + m$ being at least 1.

3,923,779

PROCESSES FOR SYNTHESIZING AZO COMPOUNDS

Harris L. Curtis, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

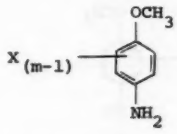
Continuation of Ser. No. 655,304, July 24, 1967, abandoned. This application Mar. 26, 1970, Ser. No. 20,482

Int. Cl.² C07C *107/04*

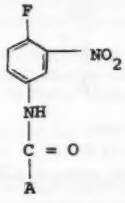
U.S. Cl. 260—202 **5 Claims**

1. A process which comprises the steps of:

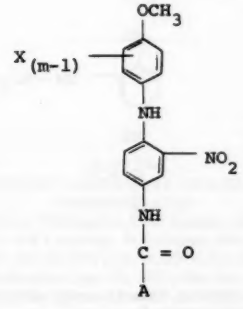
a. reacting a compound of the formula:



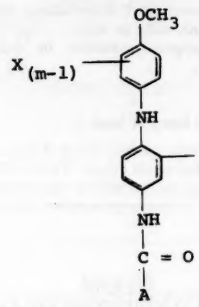
with a compound of the formula:



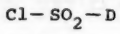
to form a compound of the formula:



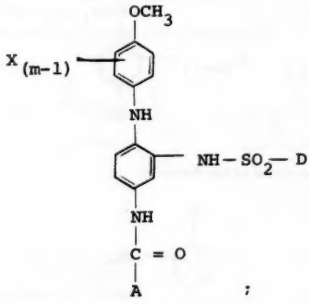
b. reducing the nitro group of said last-named compound to form a compound of the formula:



c. reacting said last-named compound with a dye salt of the formula:

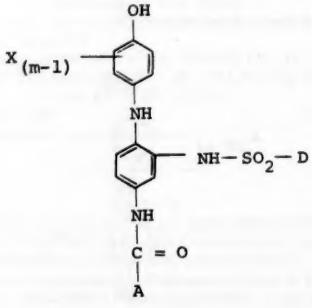


to form a compound of the formula:



and

d. removing said CH_3 moiety to form a compound of the formula:



wherein:

X is methyl, methoxy, hydroxy, amino, chloro, or carboxy; *m* is a positive integer from 1 to 2;

A is an alkyl radical having from 9–17 carbon atoms and which can render the compound non-diffusible; and

D is an azo dye moiety.

3,923,780

4-(SUBSTITUTED AZOBENZENESULFONAMIDES AS FASCIOLICIDES

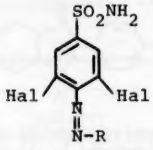
Robert E. Harmon, Kalamazoo, Mich., and Helmut H. Mrozik, Matawan, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 23, 1973, Ser. No. 408,693

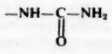
Int. Cl.[2] **A01N** *23/00*; **A61K** *3/655*; **C07C** *107/06, 107/08*

U.S. Cl. 260—207 **2 Claims**

1. A compound having the formula:



wherein Hal is fluorine, chlorine, bromine or iodine; and R is phenyl or naphthyl substituted with hydroxy and



3,923,781

GALACTOGLUCOMANNAN BORIC ACID COMPLEX

John K. Rogers, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 22, 1972, Ser. No. 255,756

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] **C07H** *23/00*; **C08B** *37/00*

U.S. Cl. 260—209 R **1 Claim**

1. Galactoglucomannan-boric acid complex stable to alkaline hydrolysis.

3,923,782

PRODUCTION OF HETEROPOLYSACCHARIDE BY FERMENTATION OF METHANOL

Robert K. Finn; Alex L. Tannahill, both of Ithaca, N.Y., and Joseph E. Laptewicz, Jr., Groton, Conn., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 29, 1973, Ser. No. 364,559

Int. Cl.[2] **C12D** *13/04*

U.S. Cl. 260—209 R **1 Claim**

1. A heteropolysaccharide of bacterial origin having an intrinsic viscosity in the range of about 10 to 20 deciliters per gram and comprising the following constituents on a weight per cent basis:

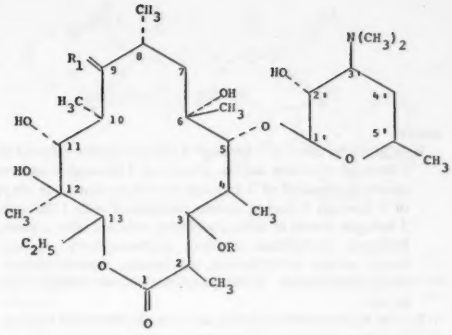
1. Organic matter of 60 to 90 percent comprising
   a. 10 to 30% glucose;
   b. 3 to 15% mannose;
   c. 3 to 15% galactose; and
   d. 5 to 35% pyruvic acid.
2. Inorganic matter of 10 to 40% comprising
   a. 5 to 25% phosphates; and
   b. 5 to 25% cations.

3,923,783
5''-AMINO-4',5''-DIDEOXYAMBUTYROSIN

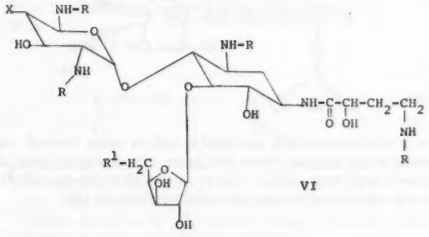
Takayuki Naito; Susumu Nakagawa, both of Tokyo, and Soichiro Toda, Koshigaya, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed June 15, 1973, Ser. No. 371,085
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C07H *15/22*
U.S. Cl. 260—210 AB 5 Claims

1. A compound having the formula

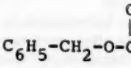


wherein
R signifies acyl and
R_1 signifies O or NOH.



VI

in which X is H, R is H or



and R^1 is N_3 or NH_2; or a pharmaceutically acceptable acid addition salt thereof.

3,923,784
ERYTHROMYCIN A DERIVATIVES

Richard W. Kierstead, and Ronald A. LeMahieu, both of North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 395,465, Sept. 10, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,561
Int. Cl.[2] C07G *3/00*
U.S. Cl. 260—210 E 10 Claims

1. A compound of the formula

3,923,785
(R)-3-(2-DEOXY-β-D-ERYTHRO-PENTOFURANOSYL)-3,6,7,8-TETRAHYDROIMIDAZO[4,5-D][1,3]DIAZEPIN-8-L

Albert Ryder; Henry W. Dion, both of Detroit; Peter W. Woo, Ann Arbor, and John D. Howells, Grosse Pointe Woods, all of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed Apr. 22, 1974, Ser. No. 462,826
Int. Cl.[2] C07H *19/16*
U.S. Cl. 260—211.5 R 3 Claims

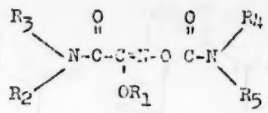
1. An essentially pure compound having the name (R)-3-(2-deoxy-β-D-erythro-pentofuranosyl)-3,6,7,8-tetrahydroimidazo[4,5-d][1,3]diazepin-8-ol.

3,923,786
1-HETEROCYCLIC CARBAMOYL-N-CARBAMOYLOXY FORMIMIDATES

Russell F. Bellina, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 55,290, July 15, 1970, Pat. No. 3,755,403. This application June 13, 1973, Ser. No. 369,607
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C07D *295/18*
U.S. Cl. 260—239 BF 3 Claims

1. A compound of the formula



where:

R_1 is glycidyl; alkyl of 1 through 4 carbon atoms; alkenyl of 3 through 4 carbon atoms; alkynyl of 3 through 4 carbon atoms; cycloalkyl of 3 through 6 carbon atoms; or alkyl of 1 through 4 carbon atoms substituted with 1 through 3 halogen atoms or with a methoxy, ethoxy, nitro, cyano, hydroxy, methylthio, carboxy, carbomethoxy, carboethoxy, amino, methylamino, ethylamino, dimethylamino, methylethylamino, methylpropylamino, or diethylamino group;

R_2 and R_3 are taken together and are alkylene of 4 through 6 carbon atoms;

R_4 is hydrogen, alkyl of 1 through 3 carbon atoms, allyl, or propargyl; and

R_5 is hydrogen or methyl.

3,923,787

α-PHOSPHINIMINE PENICILLINS AND THEIR PREPARATION

John Peter Clayton, Horsham, and Ronald Hubbard, Dorking, both of England, assignors to Beecham Group Limited, England

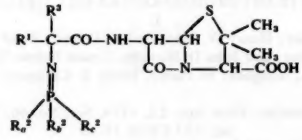
Filed July 5, 1973, Ser. No. 376,271

Claims priority, application United Kingdom, July 13, 1972, 32919/72

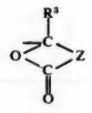
Int. Cl.² C07D *499/02*

U.S. Cl. 260—239.1 **9 Claims**

1. A process for the preparation of a penicillin of formula (I):



or a pharmaceutically acceptable salt or ester thereof, said ester being selected from the group consisting of lower alkanoyloxy-(lower alkyl), lower alkanoyloxy(lower alkyl)(-lower alkyl) and lactone esters of the formula (II):



(II),

wherein

R^3 is hydrogen, and

Z is lower alkylene, lower alkynyl or 1,2-phenylene, unsubstituted or substituted in the phenyl ring by halo, lower alkoxy or lower alkyl,

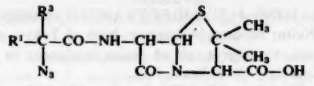
said esters being readily hydrolyzable in vivo, wherein

R^1 is hydrogen, lower alkyl, cyclohexyl, phenyl, p-hydroxyphenyl, 1,4-cyclohexadienyl, 3-thienyl or 3-pyridyl;

R^3 is as above defined, or

R^1 and R^3 together with the carbon atom to which they are joined form a cyclohexyl ring; and

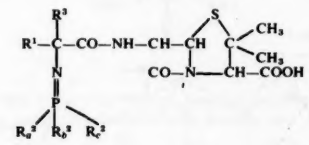
R_a^2, R_b^2 and R_c^2 are the same or different and each is methyl, ethyl, isopropyl, n-butyl, n-octyl, 2-cyanoethyl, ethoxy, dimethylamino, phenyl, p-methoxyphenyl, p-tolyl or m-tolyl, which comprises reacting a compound of formula (III):



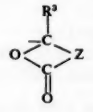
wherein R^1 and R^3 have the above meaning, or a salt or ester thereof as above defined, with a phosphine compound of the formula (IV):

in which R_a^2, R_b^2 and R_c^2 have the above meaning.

4. A penicillin of the formula (I):



or a pharmaceutically acceptable salt or ester thereof, said ester being selected from the group consisting of lower alkanoyloxy(lower alkyl), lower alkanoyloxy(lower alkyl)(-lower alkyl) and lactone esters of the formula (II):



(II),

wherein

R^3 is hydrogen, and

Z is lower alkylene, lower alkynyl or 1,2-phenylene, unsubstituted or substituted in the phenyl ring by halo, lower alkoxy or lower alkyl,

said esters being readily hydrolyzable in vivo, wherein

R^1 is hydrogen, lower alkyl, cyclohexyl, phenyl, p-hydroxyphenyl, 1,4-cyclohexadienyl, 3-thienyl or 3-pyridyl;

R^3 is as above defined, or

R^1 and R^3 together with the carbon atom to which they are joined form a cyclohexyl ring; and

R_a^2, R_b^2 and R_c^2 are the same or different and each is methyl, ethyl, isopropyl, n-butyl, n-octyl, 2-cyanoethyl, ethoxy, dimethylamino, phenyl, p-methoxyphenyl, p-tolyl or m-tolyl.

3,923,788

PENICILLINS

Harry Ferres, Horsham; Adrian Victor Kemmenoe, Westcott, and Desmond John Best, Sutton, all of England, assignors to Bayer Aktiengesellschaft, Germany

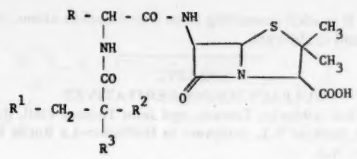
Filed May 3, 1974, Ser. No. 466,814

Claims priority, application United Kingdom, May 4, 1973, 21203/73

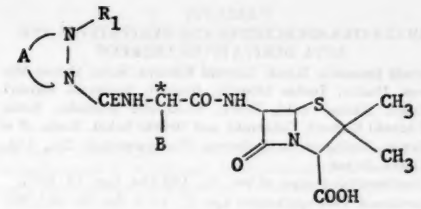
Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **15 Claims**

1. A penicillin of formula (I):



(I)

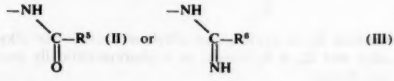


wherein

R is phenyl, hydroxyphenyl, halophenyl, nitrophenyl, alkoxyphenyl having 1–3 carbon atoms in the alkoxy part, aminophenyl, 2- or 3-thienyl, cycloalkyl having 3-7 carbon atoms in the cyclo part, cycloalkenyl having 5–7 carbon atoms in the cyclo part, or alkyl having 1–4 carbon atoms;

R^1 is 2- or 3-thienyl, indol-3-yl or 1H-imidazol-5-yl;

R^2 is



(II) or (III)

in which R^5 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part, cyclohexylamino, hydrogen, alkyl or 1–4 carbon atoms or phenyl, and R^6 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part or cyclohexylamino;

R^3 is hydrogen or alkyl of 1–3 carbon atoms; or a pharmaceutically acceptable salt or a pharmaceutically acceptable hydrolyzable ester which converts to the free acid form in vivo.

3,923,789

PENICILLINS

Wilfried Schrock; Karl-Georg Metzger, and Hans-Bodo Konig, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 15, 1974, Ser. No. 461,227

Claims priority, application Germany, Apr. 19, 1973, 2320039

Int. Cl.² C07D 499/46

U.S. Cl. 260—239.1 **67 Claims**

1. A compound of the formula

or a pharmaceutically acceptable nontoxic salt thereof

wherein

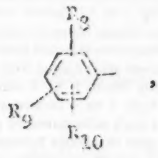
R_1 is hydrogen, straight or branched chain alkyl of one to five carbon atoms, monoaralkyl of up to eight carbon atoms, monoaryl, or thienyl; E is oxygen or sulfur; and C* is a carbon atom constituting a center of chirality;

A is a moiety of the formula:

wherein

R_2 and R_3 are the same or different and each is hydrogen, straight or branched chain alkyl of one to five carbon atoms, monoaralkyl of up to eight carbon atoms, monoaryl, or thienyl;

B is a moiety of the formula:



wherein

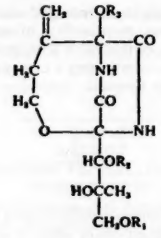
R_8, R_9 and R_{10} are the same or different and each is hydrogen, fluorine, chlorine, bromine, iodine, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulphonyl, sulphamyl, nitro, cyano, di(lower alkyl)amino, lower alkanoylamino, lower alkanoyloxy, lower alkylsulphonylamino, trifluoromethyl or hydroxy.

3,923,790
DIAZA-OXA-BICYCLODECANE DERIVATIVES AND ACYL DERIVATIVES THEREOF

Hiroshi Imanaka, Ikeda; Takashi Kamiya, Suita; Shizuo Maeno, Osaka; Toshio Miyoshi, Ibaraki; Norimasa Miyairi, Suita; Hatsuo Aoki, Ikeda; Masanobu Kohsaka, Suita; Tadaaki Komori, Takatsuki, and Heiichi Sakai, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 188,554, Oct. 12, 1971, abandoned. This application Apr. 23, 1974, Ser. No. 463,382
Claims priority, application Japan, Oct. 12, 1970, 45-89840
Int. Cl.² C07D *498/08*
U.S. Cl. 260—239.3 B 10 Claims

1. A compound selected from the group of compounds represented by the formula



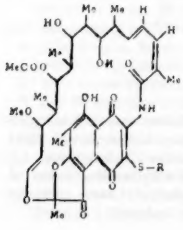
wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen and acyl and may be the same or different, the acyl group being selected from the group consisting of alkanoyl having from 2 to 20 carbon atoms; alkanoyl interrupted by a sulfur atom having 2 to 10 carbon atoms; alkenoyl having from 2 to 10 carbon atoms; benzoyl which may be substituted by one or more substituents selected from the group consisting of halogen, nitro, lower alkyl having from 1 to 4 carbon atoms, lower alkoxy having from 1 to 2 carbon atoms, and alkanoyloxy having from 1 to 4 carbon atoms; lower alkanoyl and lower alkenoyl each substituted by phenyl which may be substituted by halogen or alkoxy having from 1 to 3 carbon atoms, wherein said alkane or alkene moiety may be interrupted by an oxygen atom; lower alkanoyl substituted by thienyl; cyclohexylcarbonyl; 3-methoxycarbonyl-propionyl; and heterocyclic ring carbonyl and benzenefused heterocyclic ring carbonyl, said heterocyclic ring and benzenefused heterocyclic ring being selected from the group consisting of pyridyl, furyl, thienyl, tetrahydrothienyl and benzothiazolinyl.

3,923,791
PREPARATION OF THIOETHERS OF RIFAMYCIN S AND RIFAMYCIN SV

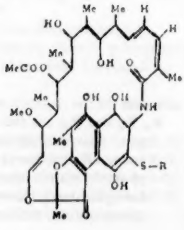
Walter D. Celmer, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,721
Int. Cl.² C07D *498/02*
U.S. Cl. 260—239.3 6 Claims

1. A 3-thioether of rifamycin S and rifamycin SV having the formulae selected from the group consisting of



and



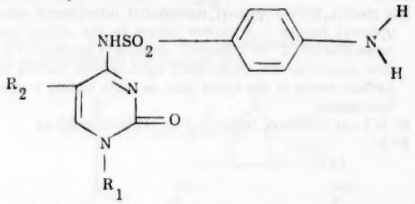
wherein R is alkyl containing from 2 to 5 carbon atoms, allyl, phenyl and cyclohexyl.

3,923,792
SULFACYTOSINE DERIVATIVES

Harry Allen Albrecht, Towaco, and John Thomas Plati, Rutherford, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 19, 1974, Ser. No. 480,784
Int. Cl.² C07D *239/44*
U.S. Cl. 260—239.75 5 Claims

1. A compound of the formula



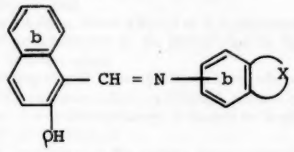
wherein R_1 is cyclo-lower alkyl or cyclo-lower alkyl-lower alkyl and R_2 is hydrogen; or a pharmaceutically acceptable salt thereof.

3,923,793
HETEROCYCLIC AMINE DYESTUFFS

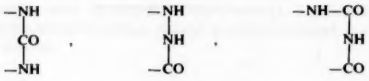
Eberhard Mundlos, Heusenstamm, and Theodor Papenfuhs, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Feb. 11, 1974, Ser. No. 441,354
Claims priority, application Germany, Feb. 15, 1973, 2307341
Int. Cl.² C07D *235/04*, *239/72*; C07C *39/14*
U.S. Cl. 260—240 F 4 Claims

1. A water-insoluble dyestuff of the formula



in which X is a radical of the formula



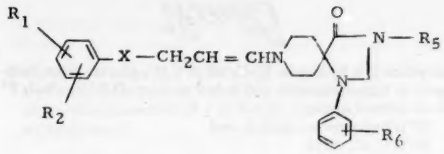
or of the formula —NH — CO — CO — NH — and the nuclei *b* may contain identical or different substituents and the substituents are chlorine, bromine, alkyl groups having 1 to 4 carbon atoms, alkoxy groups having 1 to 4 carbon atoms, nitro, cyano, hydroxy, carbonamide, sulfonamide and laked sulfonic acid groups.

3,923,794
NOVEL PROPENYLAMINE DERIVATIVES AND PROCESS FOR THE PRODUCTION THEREOF

Isamu Maruyama; Masaru Nakao; Kikuo Sasajima; Izumi Yanagihara, all of Osaka; Shigeho Inaba, and Hisao Yamamoto, both of Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 283,025, Aug. 23, 1972, Pat. No. 3,840,529. This application July 10, 1974, Ser. No. 487,401
Claims priority, application Japan, Aug. 26, 1971, 46-65641
Int. Cl.² C07D *471/10*
U.S. Cl. 260—240 A 1 Claim

1. A propenylamine derivative of the formula



wherein R_1 is a hydrogen atom, a halogen atom, a lower alkyl, lower alkoxy, nitro, lower alkanoylamino or trifluoromethyl group; R_2 is a hydrogen or halogen atom; X is an oxygen atom, a sulfur atom, a sulfinyl or sulfonyl group; R_5 is a hydrogen atom or a lower alkanoyl group and R_6 is a hydro atom, a halogen atom or a lower alkyl group and the pharmaceutically acceptable addition salts thereof.

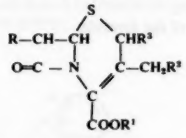
3,923,795

2-ALKOXYCEPHALOSPORINS

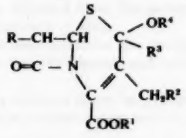
Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 19, 1972, Ser. No. 263,907
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C **16 Claims**

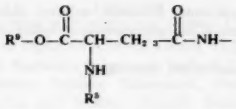
1. A process for converting a cephalosporin or a 2-methylcephalosporin of the formula



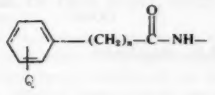
to its corresponding 2-alkoxycephalosporin of the formula



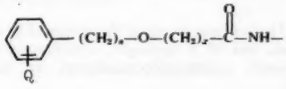
in which, in the above formulae,
R is H_2N-; phthalimido;



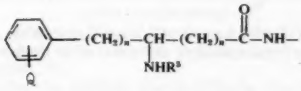
in which R^9 is hydrogen or any of the groups of R^1 as hereinbelow defined and R^5 is hydrogen, t-butyloxycarbonyl, benzyloxycarbonyl cyclopentyloxycarbonyl, or adamantyloxycarbonyl;



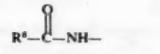
in which Q is hydrogen, C_1-C_3 alkyl, C_1-C_3 alkoxy, nitro, hydrogen, or trifluoromethyl, and n is 0 or an integer from 1 to 3;



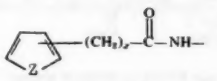
in which x is an integer from 1 to 3 and Q and n are as defined above;



in which Q, n and R^5 are as defined above;

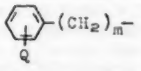


in which R^6 is hydrogen or C_1-C_6 alkyl; or



in which Z is oxygen or sulfur and x is as defined above;
R^1 is hydrogen or the residue of an ester group which is removable by saponification, hydrogenation or acid treatment;
R^2 is hydrogen;

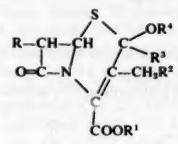
in which R^7 is hydrogen, C_1-C_8 alkyl, C_5-C_7 cycloalkyl, or



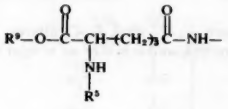
in which Q is hydrogen, C_1-C_3 alkyl, C_1-C_3 alkoxy, nitro, halogen, or trifluoromethyl, and m is 0 or 1, or —O—R^7 in which R^7 is as defined above;
R^3 is hydrogen or methyl; and
R_4 is C_1-C_4 alkyl,
which comprises reacting said cephalosporin or 2-methylcephalosporin in the presence of a C_1-C_4 alcohol with a source of positive halogen selected from the group con-

sisting of chlorine, bromine, sulfuryl chloride, sulfuryl bromide, and N-halogeno amide or imide, and an organic hypohalide.

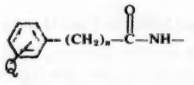
6. A compound of the formula



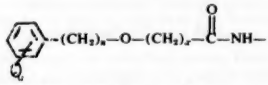
in which R is H_2N-; phthalimido;



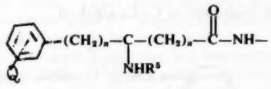
in which R^9 is hydrogen or any of the groups of R^1 as hereinbelow defined, and R^5 is hydrogen, t-butyloxycarbonyl, benzyloxycarbonyl, cyclopentyloxycarbonyl, or adamantyloxycarbonyl;



in which Q is hydrogen, C_1-C_3 alkyl, C_1-C_3 alkoxy, nitro, hydrogen, or trifluoromethyl, and n is 0 or an integer from 1 to 3;

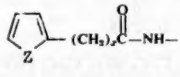


in which *x* is an integer from 1 to 3 and Q and n are as defined above;



in which Q, *n* and R^5 are as defined above;

in which R^6 is hydrogen or C_1-C_6 alkyl; or

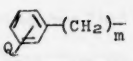


in which Z is oxygen or sulfur and x is as defined above;

R^1 is hydrogen, C_1-C_4 alkyl, 2,2,2-trichloroethyl, benzyl, benzhydryl, p-methoxybenzyl, p-nitrobenzyl, or phthalimidomethyl;

R^2 is hydrogen;

in which R^7 is hydrogen, C_1-C_6 alkyl, C_5-C_7 cycloalkyl,



in which Q is hydrogen, C_1-C_3 alkyl, C_1-C_3 alkoxy, nitro, halogen, or trifluoromethyl; and m is 0 or 1; or -O-R^7 in which R^7 is as defined above;

R^3 is hydrogen or methyl; and

R^4 is C_1-C_4 alkyl.

3,923,796

CERTAIN 6,7-DIOXO-2H-PYRROLO-[2,1-B]THIAZINES

Henry Rapoport, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

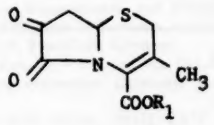
Division of Ser. No. 289,382, Sept. 15, 1972, Pat. No. 3,809,700, which is a division of Ser. No. 48,550, June 22, 1970, Pat. No. 3,714,156. This application Dec. 17, 1973, Ser. No. 425,470

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] **C07D** *499/00, 501/04, 209/00, 221/04*

U.S. Cl. 260—243 R **3 Claims**

1. A compound of the formula:



where R_1 is hydrogen, lower alkyl of from one to four carbon atoms, benzyl, p-methoxybenzyl or trichloroethyl.

3,923,797

SUBSTITUTED CARBOXIMIDIC ACID ESTERS OF 7-(2-ERCAPTOACETAMIDO) CEPHALOSPORANIC ACID DERIVATIVES

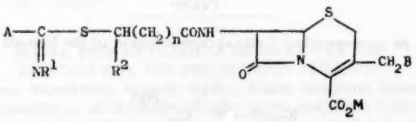
Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,014

Int. Cl.[2] **C07D** *501/28, 501/40;* **A61K** *31/545*

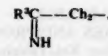
U.S. Cl. 260—243 C **23 Claims**

1. A compound of the formula:

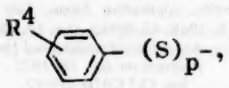


wherein

A is a member selected from the group consisting of alkyl of 1 to 6 carbon atoms;

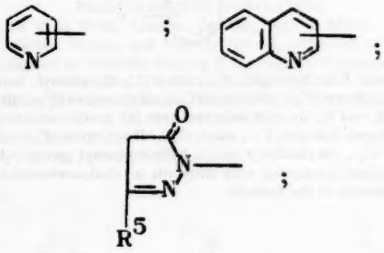


in which R^3 is alkyl of 1 to 6 carbon atoms; arylcarboxamidomethyl of 8 to 12 carbon atoms; alkanoylamidomethyl of 3 to 8 carbon atoms; α-cyanobenzyl;

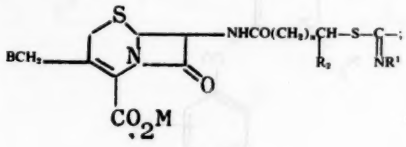


in which R^4 is hydrogen, dialkylamino of 2 to 6 carbon atoms or halo and p is 0 or 1;

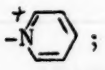
in which X is O, S or NH;



where R^5 is hydrogen, alkyl of 1 to 6 carbon atoms and phenyl; and



B is a member selected from the group consisting of —H, alkanoyloxy of 2 to 6 carbon atoms, or when taken with the 3-carboxy group,



M is a member selected from the group consisting of —H, an alkali metal and $—NH_4$;

R^1 is a member selected from the group consisting of —H, alkyl of 1 to 6 carbon atoms and aryl of 6 to 10 carbon atoms;

R^2 is a member selected from the group consisting of —H, alkyl of 1 to 6 carbon atoms and aryl of 6 to 8 carbon atoms;

n is one of the integers 0, 1 or 2; and

the pharmaceutically acceptable acid addition salts thereof.

3,923,798
PROCESS FOR RECOVERING CEPHALOSPORIN C FROM AQUEOUS SOLUTIONS THEREOF

Satoshi Horii; Nariakira Mizokami, both of Osaka; Masahiko Fujino, Hyogo; Susumu Shinagawa, Osaka; Michihiko Ochiai, Osaka, and Tetsuya Okutani, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 229,169, Feb. 24, 1972, Pat. No. 3,819,619. This application Dec. 12, 1973, Ser. No. 424,153

Claims priority, application Japan, Feb. 26, 1971, 46-10063; Feb. 26, 1971, 46-10137; Aug. 17, 1971, 46-62417

Int. Cl.² C07D *501/12, 501/26*

U.S. Cl. 260—243 C 7 Claims

1. A process for recovering cephalosporin C from an aqueous solution thereof, which comprises reacting said solution with isobornyloxycarbonyl chloride or an isobornyloxycarbonylpyridinium chloride compound to produce the corresponding N-isobornyloxycarbonylcephalosporin C, recovering said N-isobornyloxycarbonylcephalosporin C by extraction or precipitation, and removing the protective isobornyloxycarbonyl group by adding an acid to give a pH of less than about 2.5 to yield said cephalosporin C.

3,923,799
SUBSTITUTED SULFONYLACETAMIDO CEPHALOSPORINS

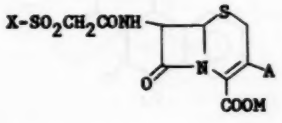
Robert M. DeMarinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 249,858, May 3, 1972, Pat. No. 3,865,819. This application Dec. 3, 1974, Ser. No. 529,164

Int. Cl.² C07D *501/28*

U.S. Cl. 260—243 C 5 Claims

1. A compound of the structure:



where:

X is CF_3;

A is hydrogen, methyl, acetoxymethyl, or pyridiniummethyl;

and M is hydrogen, alkali metal cation, nontoxic ammonium cation, or when A is pyridiniummethyl an anionic charge.

3,923,800
NOVEL PHENOTHIAZINES

Pierre Henri Deribie, Le Perreux; Jean-Paul Lavaux, Paris, and Jacques Laurent, Chilly-Mazarin, all of France, assignors to Roussel-UCLAF, Paris, France

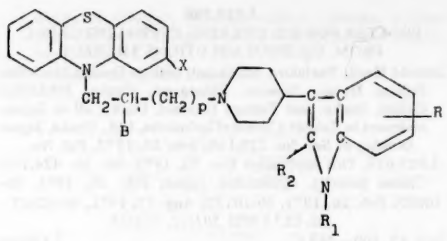
Filed Jan. 9, 1975, Ser. No. 539,639

Claims priority, application France, Jan. 21, 1974, 74.01880

Int. Cl.² C07D *209/14*

U.S. Cl. 260—243 A 11 Claims

1. A compound selected from the group consisting of a compound of the formula



wherein X is selected from the group consisting of hydrogen, chlorine, trifluoromethyl, methylthio and methoxy, B is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, p is 0 or 1, R is selected from the group consisting of hydrogen and alkoxy of 1 to 3 carbon atoms and R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms and their nontoxic, pharmaceutically acceptable acid addition salts.

3,923,801

OXAZINOBENZOTHIAZINE 6,6-DIOXIDES

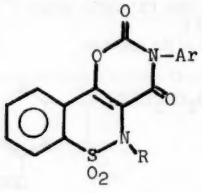
Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

Filed Sept. 23, 1974, Ser. No. 508,115

Int. Cl.² C07D *279/02*

U.S. Cl. 260—243 R **5 Claims**

1. A compound represented by the formula



wherein R is lower alkyl and Ar is an aryl radical selected from the group consisting of phenyl and substituted phenyl, wherein the substituent in said substituted phenyl is selected from the group consisting of lower alkyl, lower alkoxy, halo and trifluoromethyl.

3,923,802

PROCESS FOR PREPARING METAL SALTS OF DICHLOROISOCYANURIC ACID

Howard W. Hill, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 5, 1974, Ser. No. 485,873

Int. Cl.² C07D *251/28*

U.S. Cl. 260—248 C **3 Claims**

1. A process for preparing an alkali metal salt of dichloroisocyanuric acid comprising reacting an aqueous solution of the corresponding trialkali metal salt of cyanuric acid with a solution of trichloroisocyanuric acid in a water immiscible solvent which is relatively resistant to chlorination, said reaction to be carried out so that the reactants are maintained in the liquid phase, and said trichloroisocyanuric acid to be used at a ratio in excess of 2 mols per mol of trialkali metal salt of cyanuric acid.

3,923,803

2(1H)-QUINOZALINONES AND PROCESS THEREFOR

Shigeho Inaba, Takarazuka; Kei Takahashi, Takatsuki; Michihiro Yamamoto, Takarazuka; Kazuo Mori, Kobe; Kikuo Ishizumi, Minoo, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 840,856, July 10, 1969, abandoned. This application May 12, 1972, Ser. No. 252,947

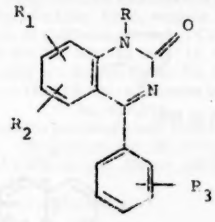
Claims priority, application Japan, July 18, 1968, 43-50982; July 18, 1968, 43-50983; Oct. 18, 1968, 43-76377

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

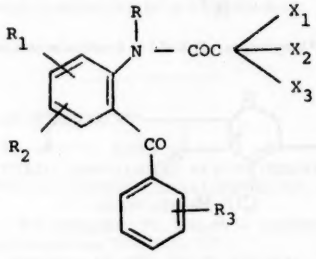
Int. Cl.² C07D *239/82*

U.S. Cl. 260—251 QB **3 Claims**

1. A process for producing a quinazoline of the formula



wherein R is hydrogen, C_1–$_4$ alkyl, C_2–C_4 alkenyl, benzyl, (C_1–$_4$ alkoxy) C_1–$_4$ alkyl or di(C_1–$_4$ alkyl) amino (C_1–$_4$ alkyl); R_1, R_2 and R_3 are each selected from the group consisting of hydrogen, halogen, C_1–$_4$ alkyl, C_1–$_4$ alkoxy, nitro, C_1–$_4$ alkylthio, C_1–$_4$ alkylsulfonyl and a trifluoromethyl group, which comprises contacting with ammonia a trihaloacetamidobenzophenone of the formula



wherein each of X_1, X_2 and X_3 is independently a halogen atom; and R, R_1, R_2 and R_3 are as defined above.

3,923,804

NITRO-FYRIMIDINES

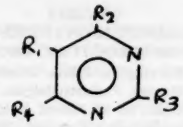
Michael E. Sitzmann, Chevy Chase, Md., and Joseph C. Dacons, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1972, Ser. No. 298,088

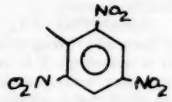
Int. Cl.² C07D *239/50*

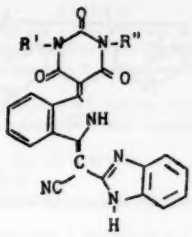
U.S. Cl. 260—251 R **5 Claims**

1. Pyrimidines of the formula



wherein R_1 is selected from the group consisting of H and NO_2 and R_2, R_3 and R_4 are selected from the group consisting of H and





in which R′ and R″ are alkyl or 1 to 5 carbon atoms, 2-chloroethyl, 2-cyanoethyl, 2-ethoxyethyl, 2-methoxyethyl, 3-methoxypropyl, 3-ethoxypropyl, 3-isopropoxypropyl, 2-phenylethyl, benzyl or phenyl, and wherein R′ and R″ may be identical or different.

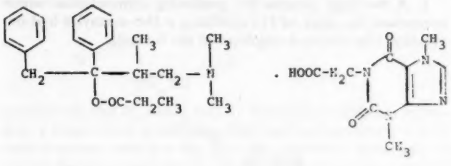
3,923,805

PROPOXYPHENE DERIVATIVE

Davide Della Bella; Arnaldo Gandini, both of Milan; Dario Chiarino, Monza, and Vittorio Ferrari, Milan, all of Italy, assignors to Whitefin Holding S.A., Lugano, Switzerland

Filed Dec. 27, 1972, Ser. No. 318,766
Claims priority, application Italy, Dec. 30, 1971, 3312/71
Int. Cl.² C07D *473/10*
U.S. Cl. 260—253 **1 Claim**

1. The compound of the formula,



3,923,806

DISPERSE DYES BASED ON ISOINDOLENE DERIVATIVES

Gustav Bock, Neustadt, and Wolfgang Elser, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 247,820, April 26, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 448,947
Claims priority, application Germany, May 3, 1971, 2121524
Int. Cl.² C07D *239/62*
U.S. Cl. 260—256.4 C **5 Claims**

1. A disperse dye of the formula

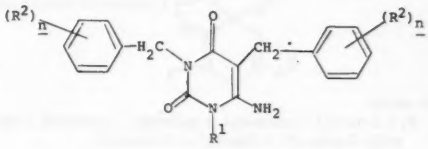
3,923,807

6-AMINOURACIL DERIVATIVES

Yoshiyasu Furukawa; Masahiro Suno, and Sawami Nose, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sept. 10, 1973, Ser. No. 395,448
Int. Cl.² C07D *239/06*
U.S. Cl. 260—256.4 C **13 Claims**

1. A 6-aminouracil of the formula



wherein R^1 is lower alkyl having up to 4 carbon atoms which may be substituted with hydroxy or lower alkoxy, having up to 4 carbon atoms, R^2 is halogen, nitro or lower alkyl having up to 4 carbon atoms and *n* is 0, 1 or 2.

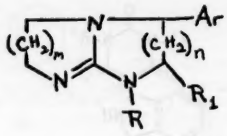
3,923,808

BICYCLIC IMIDAZOLES AND PYRIMIDINES

Josephus Ludovicus Hubertus Van Gelder; Alfons Herman Margaretha Raeymaekers, both of Beerse; Leopold Frans Corneel Roevens, Rijkevorsel, and Willy Joannes Van Laerhoven, Ravels, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 313,285, Dec. 8, 1972, Pat. No. 3,865,836. This application Aug. 13, 1974, Ser. No. 499,744
Int. Cl.² C07D *239/00*
U.S. Cl. 260—256.4 F **3 Claims**

1. A member selected from the group of compounds having the formula:



and the therapeutically active acid addition salts thereof, wherein:

either of *m* or *n* is the integer 1, the other being zero;

R is a member selected from the group consisting of hydrogen and benzyl;

R_1 is a member selected from the group consisting of hydrogen and loweralkyl, provided that, when said R_1 is loweralkyl, then said *m* is 1 and said *n* is zero; and

Ar is a member selected from the group consisting of phenyl, loweralkylphenyl, halophenyl and di-halophenyl.

3,923,809

5-ALKOXY-5-HETEROCYCLIC-1,2,3,6-TETRAHYDRO-4(5H)-PYRIMIDINETHIONES

Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

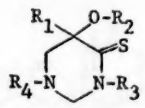
Filed Aug. 27, 1973, Ser. No. 392,154

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *239/06*

U.S. Cl. 260—256.5 R **6 Claims**

1. A compound of the formula



in which:

R_1 is 2-pyridyl, 2-pyrimidyl, 4-pyrimidyl, 2-pyrazinyl, 2-pyrrolyl, 2-quinolyl, 2-thiazolyl or 4-thiazolyl;

R_2 is lower alkyl, allyl or cyclopropanemethyl and

R_3 and R_4 are hydrogen or lower alkyl or a pharmaceutically acceptable acid addition salt thereof.

3,923,810

PERFLUOROALKANESULFONAMIDES N-SUBSTITUTED BY HETEROCYCLIC GROUPS

Joseph Kenneth Harrington, Edina; Donald C. Kvam, North Oaks; Arthur Mendel, Vadnais Heights, and Jerry E. Robertson, North Oaks, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 142,381, May 11, 1971, Pat. No. 3,801,588, which is a continuation-in-part of Ser. No. 837,932, June 30, 1969, Pat. No. 3,637,729, which is a continuation-in-part of Ser. No. 588,338, Oct. 21, 1966, abandoned. This application Jan. 28, 1974, Ser. No. 437,502

Int. Cl. C07d *239/00, 211/00*

U.S. Cl. 260—256.5 R **6 Claims**

1. A compound of the formula:

R_fSO_2NHHet

and metal, ammonium and organic amine salts thereof wherein R_f is a perfluoroalkyl group containing one to four carbon atoms, and Het is imidazo[1,2a]pyridinylphenyl or imidazo[1,2a]pyrimidylphenyl.

3,923,811

PERFLUOROALKANESULFONAMIDES N-SUBSTITUTED BY HETEROCYCLIC GROUPS

Joseph Kenneth Harrington, Edina; Donald C. Kvam, North Oaks; Arthur Mendel, Vadnais Heights, and Jerry E. Robertson, North Oaks, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 142,381, May 11, 1971, Pat. No. 3,801,588, and a continuation-in-part of Ser. No. 837,932, June 30, 1969, Pat. No. 3,637,729, which is a continuation-in-part of Ser. No. 588,338, Oct. 21, 1966, abandoned. This application Jan. 28, 1974, Ser. No. 437,499

Int. Cl.² C07D *215/40*

U.S. Cl. 260—270 D **5 Claims**

1. A compound of the formula:

$R_fSO_2NHHet - Y_n$

wherein R_f is a perfluoroalkyl group containing one to four carbon atoms, *Het* is quinolinyl, *Y* is lower alkyl, halogen, cyano, lower alkoxy, nitro, amino and lower alkanoylamido and *n* is 0–3, or an alkali metal, alkaline earth metal, zinc, alkyl amine or ammonium salt thereof.

3,923,812

SYNTHESIS OF ELYMOCLAVINE

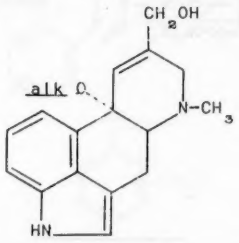
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 2, 1974, Ser. No. 494,149

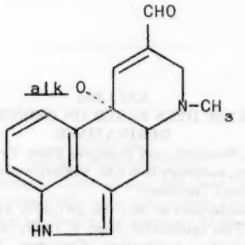
Int. Cl.³ C07D *457/02*

U.S. Cl. 260—285.5 **4 Claims**

1. A two-step process for producing elymoclavine which comprises the steps of (1) oxidizing a D-6-methyl-8-hydroxymethyl-10α-alkoxy-8-ergolene of the formula



wherein alk is (C_1-C_3) alkyl to yield a D-6-methyl-8-formyl-10α-alkoxy-8-ergolene of the formula



wherein alk has the same meaning as hereinabove, and (2) reducing said 8-formyl-8-ergolene with a metal-aqueous acid reducing system to form elymoclavine.

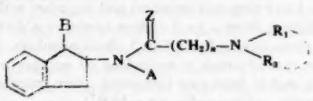
3,923,813

DERIVATIVES OF 2-AMINOINDANES

Pierre M. Vanhoof, and Pierre M. Clarebout, both of Brussels, Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

Continuation-in-part of Ser. No. 99,643, Dec. 12, 1970, abandoned. This application Mar. 8, 1973, Ser. No. 339,454
Claims priority, application United Kingdom, Dec. 19, 1969, 6200/69
Int. Cl.² C07D 295/14
U.S. Cl. 260—293.62 12 Claims

1. A new derivative of 2-aminoindane of the formula:



(I)

wherein n is equal to 1, 2 or 3, Z represents two hydrogen atoms or an oxygen atom, the $(CH_2)_n$ group having a straight or branched chain, R_1 represents hydrogen, a lower alkyl or hydroxyalkyl radical containing 1 to 3 carbon atoms or a lower alkenyl or alkynyl radical containing 2 or 3 carbon atoms, R_2 represents a lower alkyl or hydroxyalkyl radical containing 1 to 3 carbon atoms or a lower alkenyl or alkynyl radical containing 2 or 3 carbon atoms, whereby R_1 and R_2 may be identical or different and may also form together with the adjacent nitrogen atom a nitrogenous heterocyclic ring selected among the piperidino, pyrrolidino, morpholino and piperazino rings, A is a 2-pyridyl radical, an unsubstituted phenyl radical or a phenyl radical substituted by at least one substituent selected among the lower alkyl, lower alkoxy, hydroxy, trifluoromethyl, halo and nitro groups in the ortho, meta and/or para position, and B represents hydrogen, an alkoxy radical containing 1 to 3 carbon atoms or a group of the formula

in which R_3 and R_4 which may be identical or different represent a lower alkyl or hydroxyalkyl radical containing 1 to 3 carbon atoms, whereby R_3 may also represent hydrogen as well as the pharmaceutically acceptable acid addition salts of said derivative of Formula (I).

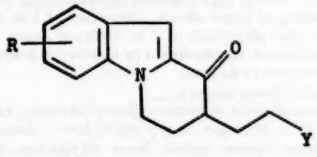
3,923,814

6,7-DIHYDROPYRIDO[1,2-A]INDOL-9(8H)ONES

David Llewellyn Coffen, Glen Ridge, and David Allen Katonak, Bloomfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 368,430, June 8, 1973, Pat. No. 3,850,934. This application Aug. 28, 1974, Ser. No. 501,315
Int. Cl.² C07D 221/04
U.S. Cl. 260—293.53 9 Claims

1. A compound of the formula



wherein R is hydrogen, amino, nitro, halogen, hydroxy, lower alkyl or lower alkoxy, and Y is halo, lower alkoxy or acyloxy.

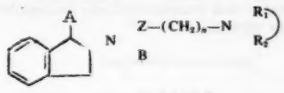
3,923,815

DERIVATIVES OF 2-AMINOINDANE THEREOF

Pierre Marie Vanhoof, and Pierre M. Clarebout, both of Brussels, Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

Filed Nov. 6, 1973, Ser. No. 413,304
Claims priority, application United Kingdom, Nov. 6, 1972, 51094/72
Int. Cl.² C07D 295/14
U.S. Cl. 260—293.62 13 Claims

1. A new 2-aminoindane derivative of the formula



(I)

in which n is equal to 1, 2, or 3, Z represents a CH_2 or CO group, R_1 and R_2 represent each a lower alkyl or hydroxyalkyl group containing 1 to 3 carbon atoms, and R_1 may also represent hydrogen, R_1 and R_2 also may form with the attached nitrogen atom a nitrogenous heterocyclic ring selected from the group consisting of piperidino, pyrrolidino, morpholino and methylpiperazino, B represents an unsubstituted phenyl group, A represents a methoxy or ethoxy group or a group of the formula

wherein R_3 and R_4 each represent a methyl or ethyl group or may form with the attached nitrogen atom a nitrogeneous heterocyclic ring selected from the group consisting of piperidino, pyrrolidino, morpholino and methylpiperazino, as well as the pharmaceutically acceptable acid addition salts of said compounds of formula I.

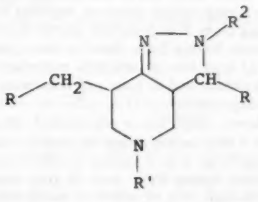
3,923,816

2H-PYRAZOLO[4,3-C]PYRIDINES

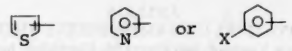
John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 22, 1974, Ser. No. 490,176
Int. Cl.² C07D 401/02
U.S. Cl. 260—293.55 7 Claims

1. A compound of the formula



wherein R is



wherein X is H, Cl, F, CF_3, alkyl of from 1 to 4 carbon atoms, or alkoxy of from 1 to 4 carbon atoms, provided each R may be the same or different;

R^1 and R^2 are H, alkyl of from 1 to 4 carbon atoms, hydroxy lower alkyl wherein the alkyl group has from 1 to 4 carbon atoms, alkanoyl of from 1 to 4 carbon atoms or X-substituted phenyl alkyl wherein X and alkyl have the same meaning as above,

and the N-oxides and pharmaceutically acceptable acid addition salts thereof.

3,923,817
2-HYDRAZONOMETHYL-3-HYDROXY-4-AZA-2,4-PENTADIENENITRILES

Kurt Klemm, Allensbach, and Erhard Langenscheid, Konstanz, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik Gesellschaft, Konstanz, Germany

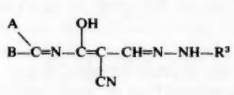
Filed Sept. 4, 1973, Ser. No. 393,813

Claims priority, application Luxemburg, Sept. 8, 1972, 66036; Sept. 8, 1972, 66037; Sept. 8, 1972, 66038

Int. Cl.² C07D *295/14*

U.S. Cl. 260—293.87 **19 Claims**

1. A 2-acylhydrazonomethyl-3-hydroxy-5-A-5-B-4-aza-2,4-pentadienenitrile of the formula



I

wherein

A is a member selected from the group consisting of —H, —OH, $-N(R^8)R^9$ and $-N(R^8)-CO-R^9$;

B is one of the meanings of, but different from, A;

R^3 is $-C(X)-R^4$, $-C(X)-Y-R^4$ or $-C(X)-N(R^5)R^6$;

R^4 is —H, substituted or unsubstituted alkyl having from 1 to 14 carbon atoms, substituted or unsubstituted alkenyl having from 2 to 14 carbon atoms, substituted or unsubstituted alkynyl having from 2 to 14 carbon atoms, substituted or unsubstituted alkoxyalkyl having from 2 to 13 carbon atoms, substituted or unsubstituted alkenyloxyalkyl having up to 13 carbon atoms, substituted or unsubstituted cycloalkyl having from 3 to 6 ring carbon atoms, substituted or unsubstituted phenyl, nuclearly-substituted or unsubstituted phen(lower)alkyl; any substituent of substituted alkyl, substituted alkenyl, substituted alkynyl, substituted alkoxyalkyl and substituted alkenyloxyalkyl being a salt-forming basic group $-N(R^5)R^6$; any substituent of substituted cycloalkyl being methyl or a salt-forming basic group $-N(R^5)R^6$; and any substituent of substituted phenyl or substituted phenalkyl being lower alkyl, lower alkoxy, lower alkylmercapto, alkoxycarbonyl with from 2 to 5 carbon atoms, halo, trifluoromethyl, nitro or cyano;

R^5 is —H, lower alkyl, lower alkoxyalkyl, cycloalkyl with from 3 to 6 ring carbon atoms or, together with R^6, alkylene having from 2 to 5 carbon atoms or a divalent aliphatic chain having from three to five chain members, each of at least two of which is methylene or another lower alkylidene and at least one remaining chain member is, independently, —O—, —S— or $-N(R^7)-$;

R^6 is -H, lower alkyl, lower alkoxyalkyl, cycloalkyl with from 3 to 6 ring carbon atoms or, together with R^5, alkylene having from 2 to 5 carbon atoms or a divalent aliphatic chain having from three to five chain members, each of at least two of which is methylene or another lower alkylidene and at least one remaining chain member is, independently, —O—, —S— or $-N(R^7)-$;

R^7 is -H or lower alkyl;

R^8 is a member selected from the group consisting of —H, lower alkyl, lower alkoxyalkyl, cycloalkyl having from 3 to 6 ring carbon atoms, methyl-substituted cycloalkyl with from 3 to 6 ring carbon atoms and, together with R^9, alkylene having from 2 to 5 carbon atoms or a divalent aliphatic chain having from 3 to 5 chain members, each of at least two of which is methylene or another lower alkylidene and at least one remaining chain member is, independently, —O—, —S— or $-N(R^7)-$;

R^9 is a member selected from the group consisting of —H, lower alkyl, lower alkoxyalkyl, cycloalkyl having from 3 to 6 ring carbon atoms, methyl-substituted cycloalkyl with from 3 to 6 ring carbon atoms and, together with R^8, alkylene having from 2 to 5 carbon atoms or a divalent aliphatic chain having from 3 to 5 chain members, each of at least two of which is methylene or another lower alkylidene and at least one remaining chain member is independently, —O—, —S— or $-N(R^7)-$;

X is =O, =S or $=NR^7$; and

Y is —O— or —S—.

3,923,818
1,4-DIHYDROPYRIDINES

Friedrich Bossert; Horst Meyer, both of Wuppertal-Elberfeld, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

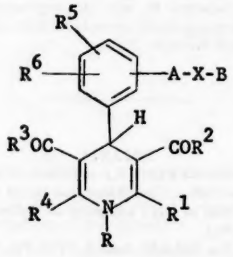
Filed June 4, 1973, Ser. No. 366,578

Claims priority, application Germany, Dec. 22, 1972, 2228363

Int. Cl.² C07D *213/32*

U.S. Cl. 260—294.8 G **25 Claims**

1. A compound of the formula:



wherein

R is hydrogen, lower alkyl or alkenyl of 2 to 4 carbon atoms;

each of R^1 and R^4 is hydrogen or lower alkyl;

each of R^2 and R^3 is lower alkyl, alkenyl of 2 to 4 carbon atoms, furfuryl or a member selected from the group consisting of lower alkoxy, alkenyloxy of 2 to 4 carbon atoms and alkynyloxy of 2 to 4 carbon atoms which is unsubstituted, or substituted by hydroxy or lower alkoxy;

A is oxygen or sulphur;

B is carbo-(lower alkoxy);

X is lower alkylene or hydroxy-(lower alkylene); each of R^5 and R^6 is hydrogen, lower alkyl, lower alkoxy, nitro, halogeno, cyano, amino, lower alkylamino, di-(lower alkyl)amino or acetylamino,

or a nontoxic pharmaceutically acceptable acid addition salt thereof.

3,923,819

CATALYST FOR THE PRODUCTION OF AROMATIC OR HETERO-AROMATIC NITRILES

Theodor Lussling; Hans Schaefer, both of Grossauheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Division of Ser. No. 74,829, Sept. 23, 1970, abandoned. This application June 22, 1973, Ser. No. 372,673

Claims priority, application Germany, Sept. 26, 1969, 1948715

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **19 Claims**

1. A process for the production of an aromatic or heterocyclic nitrile from a mixture of an alkyl substituted aromatic or heteroaromatic hydrocarbon selected from the group consisting of lower alkylbenzene, lower alkyl naphthalene, lower alkyl cyanobenzene lower alkyl chlorobenzene, lower alkyl pyridine and lower alkyl quinoline ammonia and oxygen consisting essentially of contacting said mixture in gaseous form with a catalyst consisting essentially of the product prepared by heating to from 650° to 1100°C. a member of the group consisting of (a) a mixture consisting of antimony oxide and tungsten oxide wherein the atomic ratio of antimony to tungsten is from 1.1 to 1 up to 50 to 1, (b) a mixture consisting of antimony oxide, tungsten oxide and vanadium oxide wherein the atomic ratio of antimony to tungsten and vanadium combined is from 1.1 to 1 up to 50 to 1 and the atomic ratio of tungsten to vanadium is from 0.25 to 1 up to 20 to 1, (c) a mixture consisting of antimony oxide, tungsten oxide and at least one other element of the group consisting of manganese, chromium, iron, cobalt, nickel and copper wherein the atomic ratio of antimony to tungsten is from 1.1 to 1 up to 50 to 1 and the atomic ratio of antimony to the total of manganese, chromium, iron, cobalt, nickel and copper is from 4 to 1 up to 20 to 1 with the atomic portion of the total of said manganese, chromium, iron, cobalt, nickel and copper not exceeding the atomic portion of tungsten and (d) a mixture consisting of antimony oxide, tungsten oxide, vanadium oxide and at least one element of the group consisting of manganese, chromium, iron, cobalt, nickel and copper wherein the atomic ratio of antimony to tungsten and vanadium combined is from 1.1 to 1 up to 50 to 1, the atomic ratio of tungsten to vanadium is from 0.25 to 1 up to 20 to 1 and the atomic ratio of antimony to the total of manganese, chromium, iron, cobalt, nickel and copper is from 4 to 1 up to 20 to 1 with the atomic portion of the total of said manganese, chromium, iron, cobalt, nickel and copper not exceeding the combined atomic portion of tungsten and vanadium.

3,923,820

METHOD OF OBTAINING 3,5 DI-METHYLBENZAMID SUBSTITUTES

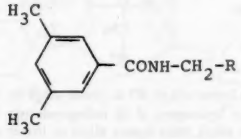
Cristobal Martinez Roldan; Miguel Fernandez Brana, and Jose Maria Castellano Berlanga, all of Madrid, Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Filed Apr. 8, 1974, Ser. No. 458,893

Int. Cl.² C07D *213/06*

U.S. Cl. 260—295 AM **4 Claims**

1. A compound having the formula



wherein R is 2-pyridyl, 3-pyridyl or 4-pyridyl.

3,923,821

NOVEL 4,4'-BIPYRIDINIUM SALTS

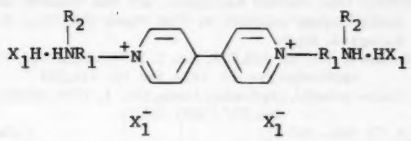
Phylis T. Moore, Morgantown, W. Va., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 7, 1973, Ser. No. 395,254

Int. Cl.² C07D *213/22*

U.S. Cl. 260—296 D **8 Claims**

1. A water-soluble viologen salt of the formula:



wherein R_1 is propylene or a straight-chain alkylene group having from 6 to 12 carbon atoms in the chain; R_2 is —H or a hydrocarbon group having from 1 to 6 carbon atoms; and X_1 is halide.

3,923,822

6-FLUORO-3,5-DIHALO-2-PYRIDINOLS

Penelope B. Domenico, Fairfax, Va., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1973, Ser. No. 425,572

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *213/64*

U.S. Cl. 260—297 R **2 Claims**

1. 6-Fluoro-3,5-dibromo-2-pyridinol.
2. 6-Fluoro-3,5-dichloro-2-pyridinol.

3,923,823

ANTIBIOTIC A23187 AND PROCESS FOR PREPARATION THEREOF

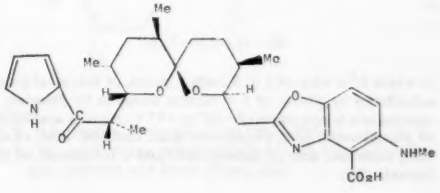
Richard M. Gale; Calvin E. Higgens, and Marvin M. Hoehn, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 237,532, March 23, 1972, abandoned. This application Jan. 17, 1974, Ser. No. 434,312

Int. Cl.² C07D *263/56*

U.S. Cl. 260—299 **1 Claim**

1. The antibiotic compound of the formula



or an alkali metal, alkaline earth metal, cadmium or manganese salt thereof.

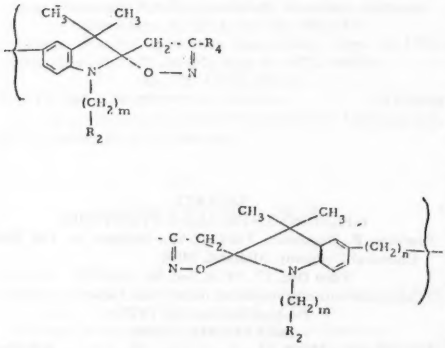
3,923,824

SPIRO (INDOLINE-2,5-ISOXAZOLINE) COMPOUNDS

Hisatake Ono; Harumi Katsuyama, and Shu Watarai, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 185,818, Oct. 1, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 436,394
Claims priority, application Japan, Oct. 1, 1970, 45-86238
Int. Cl.[2] C07D *263/14*
U.S. Cl. 260—307 F 1 Claim

1. A polymer having the repeating unit represented by the Formula (IV):



wherein/R_2 is hydrogen, hydroxyl, alkoxycarbonyl having alkyl which has 1 to 4 carbon atoms, cyan or phenyl; R_4 is either a direct bond of carbon atoms, an alkylene chain having 1 to 3 carbon atoms or phenylene, m is an integer from 1 to 4; n is either zero, the integer 1 or the integer 2; said polymer having a reduced viscosity of from 0.03 to 0.6 in a one weight percent concentration of tetrahydrofuran at 30.0°C.

3,923,825

PRODUCTION OF ISOOXAZOLE

Hans-Juergen Quadbeck-Seeger, Ludwigshafen; Willibald Schoenleben, Heidelberg, and Dieter Schneider, Edingen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Feb. 27, 1974, Ser. No. 446,330
Claims priority, application Germany, Mar. 1, 1973, 2310185
Int. Cl.[2] C07D *261/08*
U.S. Cl. 260—307 H 19 Claims

1. A process for the production of isooxazole wherein in a first stage a vinyl ether of the formula (I):

$$R^1-O-CH=CH_2 \qquad (I)$$

in which R^1 is alkyl of 1 to 8 carbon atoms, or said alkyl group substituted by alkoxy of 1–4 carbon atoms or by chlorine, is reacted at a temperature of −10° to +75°C. with an acid halide of phosphorous acid, phosphoric acid, carbonic acid, oxalic acid, sulfurous acid or sulfuric acid and a formamide of the formula (II):

(II)

in which R^2 and R^3 individually are alkyl of 1 to 4 carbon atoms or phenyl; or

R^2 and R^3 together with the adjacent nitrogen atom form heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, morpholino, or pyrrolidone, which may contain another nitrogen atom or an oxygen atom, or in which said alkyl group, said phenyl group or said heterocyclic ring of R^2 and R^3 is substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or chlorine; and in a second stage the reaction mixture thus formed is reacted at a temperature of 75°–150°C. with hyroxylamine.

3,923,826

SYNTHESIS OF 5-(BETA-METHYLMERCAPTOETHYL)-YDANTOIN

Yoshio Namito; Masahiro Kobayashi, and Takeshi Kojima, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 17, 1974, Ser. No. 480,277
Claims priority, application Japan, June 20, 1973, 48-70168
Int. Cl.[2] C07D *49/34*
U.S. Cl. 260—309.5 10 Claims

1. A method of synthesizing 5-(β-methylmercaptoethyl) hydantoin which comprises reacting β-methylmercaptopropionaldehyde with reactants consisting essentially of, per mole of β-methylmercaptopropionaldehyde, 1–2 moles of hydrogen cyanide and 1–3 moles of a CO_2 and NH_3 source selected from the group consisting of ammonium bicarbonate, ammonium carbonate and and a mixture of carbon dioxide and ammonia in the presence of 0.1–2 moles of a caustic alkali.

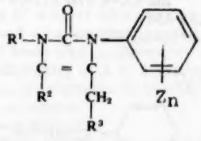
3,923,827

PREPARATION OF 4-IMIDAZOLIN-2-ONES

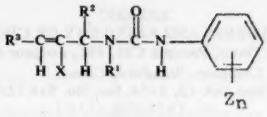
William D. Dixon, Kirkwood, and Bracey R. Dangerfield, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 376,494, July 5, 1973, abandoned. This application Nov. 19, 1974, Ser. No. 525,257
Int. Cl.[2] C07D *49/34*
U.S. Cl. 260—309.6 5 Claims

1. A process for preparing a compound of the formula



wherein R^1 is lower alkyl, R^2 is lower alkyl or hydrogen, R^3 is lower alkyl or hydrogen, Z is independently fluoro, chloro, bromo, lower alkyl, halo lower alkyl or lower alkoxy and *n* is an integer zero through 2 which comprises cyclizing a solution of a compound of the formula



wherein R^1, R^2, R^3, Z and *n* are the same as hereinabove defined and X is halo in the presence of a base at a temperature in the range of about 20°C. to the reflux temperature of the system.

3,923,828
PROCESS FOR SEPARATING N-METHYL-NITROPHTHALIMIDES

Frank J. Williams, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 8, 1974, Ser. No. 468,000
Int. Cl.² C07D *209/40*
U.S. Cl. 260—326 N **7 Claims**

1. In the process for isolating N-methyl-4-nitrophthalimide from a mixture of the latter and N-methyl-3-nitrophthalimide, the improvement which comprises contacting the mixture with a lower alkanol of from 1 to 2 carbon atoms, separating the alkanol solution rich in the N-methyl-3-nitrophthalimide thereby isolating the N-methyl-4-nitrophthalimide.

3,923,829
PREPARATION OF N-(1-ETHYL-α-PYRROLIDYLMETHYL)-2-METHOXY-5-ULFONAMIDOBENZAMIDE

Eric Alain Denzler, Zurich, Switzerland, assignor to Fratmann AG, Switzerland

Continuation-in-part of Ser. No. 286,881, Sept. 7, 1972, abandoned. This application Nov. 19, 1974, Ser. No. 525,153
Claims priority, application Switzerland, June 13, 1972, 8813/72
Int. Cl.² C07D *207/14*
U.S. Cl. 260—326.47 **2 Claims**

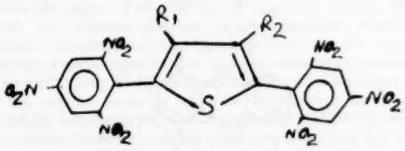
1. A process for preparing N-(1-ethyl-α-pyrrolidylmethyl)-2-methoxy-5-sulfonamidobenzamide, comprising the steps of mixing N-ethyl-α-aminomethyl-pyrrolidine with phosphorus oxychloride in a solvent selected from pyridine and dioxane to form N,N′, N″-(1-ethyl-α-pyrrolidylmethyl)-phosphoramide, removing the dioxane, if present, and then heating at 75° to 150°C. the N,N′,N″-(1-ethyl-α-pyrrolidyl-methyl)-phosphoramide with 2-methoxy-5-sulfonamidobenzoic acid in pyridine in the presence or absence of autogenous pressure.

3,923,830
2,5-DIPICRYL THIOPHENES

Michael E. Sitzmann, Chevy Chase, Md., and Joseph C. Dacons, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1972, Ser. No. 298,089
Int. Cl.² C07D *333/12*
U.S. Cl. 260—329 R **4 Claims**

1. Compounds of the formula



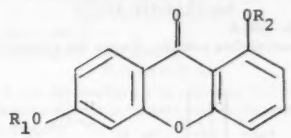
wherein R_1 and R_2 are selected from the group consisting of H and NO_2.

3,923,831
(8-SUBSTITUTED-9-OXOXANTHEN-3-YLOXY) ACETAMIDOXIMES AND NITRILES FOR THEIR PREPARATION

Arthur A. Santilli, Havertown, and Anthony C. Scotese, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,051
Int. Cl.² C07D *311/84*
U.S. Cl. 260—335 **2 Claims**

1. A compound selected from those having the formula



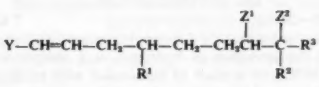
where R_1 is acetamidoxime; and R_2 is lower alkyl; and the pharmacologically active addition salts thereof.

3,923,832
INSECTICIDAL SUBSTITUTED ALKENES

Eric Jan Leopold, Palo Alto, Calif., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 27, 1973, Ser. No. 354,970
Int. Cl.² C07D *317/50, 319/18*
U.S. Cl. 260—340.5 **2 Claims**

1. A compound having the formula



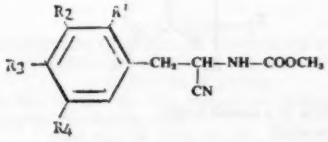
wherein each of R^1, R^2 and R^3 is independently methyl or ethyl; Z^1 and Z^2 together are a carbon to carbon bond; and Y represents 3,4-methylenedioxyphenyl or 3,4-ethylenedioxyphenyl.

3,923,833
N-[(1-CYANO-2-PHENYL)ETHYL]CARBAMATES

Vsevolod Gruenman, Montclair, and Max Hoffer, Nutley, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 184,950, Sept. 29, 1971, abandoned, which is a division of Ser. No. 13,769, Feb. 24, 1970, Pat. No. 3,636,039, which is a continuation-in-part of Ser. No. 725,946, May 1, 1968, abandoned. This application Feb. 7, 1974, Ser. No. 440,638
Int. Cl.² C07C *121/66;* **C07D** *317/60*
U.S. Cl. 260—340.5 **1 Claim**

1. A compound of the formula



VI

where

R′ is hydrogen, lower alkyl and lower alkoxy;

R_3, R_3 and R_4 taken independently of each other are hydrogen, hydroxy and lower alkoxy and

R', R_2, R_3 and R_4 taken as an adjacent pair is methylenedioxy.

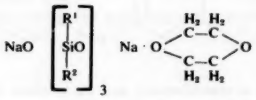
3,923,834

SILOXANEDIOLATE COMPLEXES AND PREPARATION THEREOF

Terry G. Selin, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 19, 1966, Ser. No. 602,490
Int. Cl.² C07D 319/12
U.S. Cl. 260—340.6 5 Claims

1. A siloxanediolate complex having the general formula



wherein R^1 and R^2 are aryl radicals.

3,923,835

PROCESS FOR MAKING 4-BUTYROLACTONE

William E. Smith, Schenectady, N.N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,802
Int. Cl.² C07D 307/32
U.S. Cl. 260—343.6 7 Claims

1. The process for making 4-butyrolactone which comprises reacting, in the presence of hydrogen at a temperature in excess of 150°C., an acetate of butanediol with methanol in the vapor phase in the presence of a catalyst mixture consisting essentially of magnesia and a copper dehydrogenating catalyst.

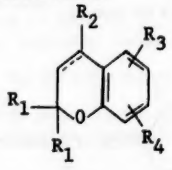
3,923,836

CHROMAN AND CHROMENE COMPOUNDS

Paul E. Bender, Willingboro, N.J., and Bernard Loev, Broomall, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed July 18, 1973, Ser. No. 380,446
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C07D 311/16, 311/70, 311/58
U.S. Cl. 260—345.2 5 Claims

1. A compound of the formula:



in which

is a single or a double bond;

R_1 is lower alkyl;

R_2 is cycloalkyl or cycloalkenyl, said cycloalkyl and cycloalkenyl having 5–6 carbon atoms;

R_3 is hydroxy or an alkali metal salt thereof, lower alkoxy or lower alkanoyloxy and

R_4 is a straight or branched alkyl or alkoxy group having 5 to 12 carbon atoms.

3,923,837

EXTRACTION AND RECOVERY OF CINEOLE

Curry Beach Davis, Panama City, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 15, 1974, Ser. No. 514,725
Int. Cl.² C07D 311/02
U.S. Cl. 260—345.2 2 Claims

1. The method of extracting cineole from a cineole-containing terpene fraction which comprises the steps of: adding to said cineole-containing fraction concentrated sulfuric acid ranging from about 60% to about 70% at a temperature between about −20°C and about 0°C and wherein the ratio of said acid added to cineole ranges between about 1.25 and 2.5, by weight, based on the amount of cineole in the terpene fraction so as to form (a) an acid fraction comprising stable oxonium salt of said cineole and (b) a hydrocarbon terpene fraction, separating resultant oxonium salt fraction from the terpene fraction, treating so-recovered oxonium salt fraction with water to convert said salt to cineole, and thereafter recovering cineole therefrom.

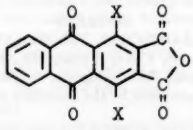
3,923,838

PRODUCTION OF CHLOROANTHRAQUINONE-2,3-DICARBOXYLIC ACID ANHYDRIDES

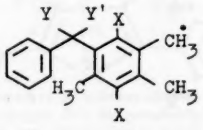
Heinz Eilingsfeld, Frankenthal; Wolfgang Eisfeld, Ludwigshafen; Manfred Patsch, Ludwigshafen, and Ernst Schaffner, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 19, 1973, Ser. No. 417,122
Claims priority, application Germany, Nov. 18, 1972, 2256663
Int. Cl.² C07D 307/89; C07C 66/02
U.S. Cl. 260—346.3 10 Claims

1. A process for the production of a chloroanthraquinone-2,3-dicarboxylic acid anhydride of the formula:



in which one X is chlorine and the other X is hydrogen or both X's are chlorine wherein a trimethyl compound of the formula:



in which the group

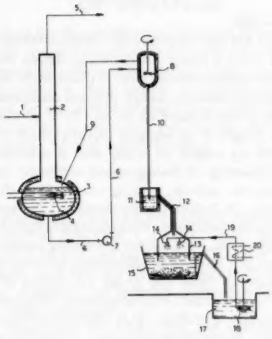
and X have the above meanings is oxidized into the tricarboxylic acid by oxidation with air, oxygen or a mixture of the same or with 10 to 30% by weight nitric acid and the oxidation product is cyclized by means of a water-eliminating agent at 120° to 280°C.

3,923,839

METHOD OF TREATING THE RESIDUES FROM THE DISTILLATION OF PHTHALIC ANHYDRIDE

Rene Dumont, Autreville; Maurice Goharel, and Jean-Claude Lafont, both of Sinceny, all of France, assignors to Rhone-Progil, Courbevoie, France

Filed Apr. 2, 1974, Ser. No. 457,190
Claims priority, application France, Apr. 5, 1973, 73.12301
Int. Cl.² C07D *307/89*
U.S. Cl. 260—346.7 **4 Claims**



1. A method of treating the residues from the distillation of phthalic anhydride from the oxidation product of ortho xylene or naphthalene, characterized in that it comprises drawing off from the boiler of the distillation column for distilling said anhydride, an amount of product such that the volume of the bottoms product remains substantially constant, subjecting the product drawn off to a thin-layer evaporation operation at a temperature within the range of 230°–280°C and a pressure within the range of 60–300 mm of mercury, recyling to the boiler the lightest fraction which essentially comprises phthalic anhydride vapors, passing the heavy fraction into the column of small cross-section, spraying water at a temperature of 0–100°C onto the liquid stream flowing from the lower part of the column, isolating from the atmosphere the zone in which the water spraying action is effected and through which the residues flow before being cooled, by a chamber the lower open portion of which is immersed in a volume of water at the bottom of which are deposited and residues which are cooled to solidification temperature and granulated by the water spray.

3,923,840

N-(FURANYLMETHYL) FLUOROALKANESULFONAMIDES

Joseph Kenneth Harrington, Edina, and Robert D. Trepka, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 150,789, June 7, 1971, Pat. No. 3,766,193, Continuation-in-part of Ser. No. 795,050, Jan. 29, 1969, Pat. No. 3,629,332. This application July 12, 1973, Ser. No. 378,621
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C07D *307/52*
U.S. Cl. 260—347.2 **3 Claims**

1. A compound of the formula

$$R_fSO_2NH\text{-}R\text{-}Ar$$

wherein R_f is a fluoroalkyl group of one or two carbon atoms, R is methylene and Ar is furanyl, and horticulturally acceptable salts thereof.

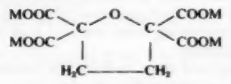
3,923,841

METHOD OF MAKING TETRA SODIUM AND TETRA POTASSIUM 2,2,5,5-TETRAHYDROFURANTETRACARBOXYLATE

Marvin M. Crutchfield, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 282,991, Aug. 23, 1972, abandoned. This application Nov. 6, 1974, Ser. No. 521,330
Int. Cl.² C07D *307/24*
U.S. Cl. 260—347.3 **5 Claims**

1. A process for preparing compounds represented by the formula



wherein M is selected from the group consisting of sodium and potassium, said process comprising adding 2,2,5,5-tetracyanotetrahydrofuran to an aqueous solution of sodium hydroxide or potassium hydroxide maintained during the addition at a concentration such that the sodium hydroxide or potassium hydroxide is present in an amount in excess of that stoichiometrically required to hydrolyze the 2,2,5,5-tetracyanotetrahydrofuran in the reaction medium and hydrolyzing the 2,2,5,5-tetracyanotetrahydrofuran.

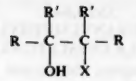
3,923,842

PREPARATION OF OXIRANE COMPOUND FROM THE CORRESPONDING OLEFIN VIA THE CYCLIC CARBONATE ESTER

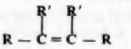
Yulin Wu, Bartlesville, OK, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 28, 1974, Ser. No. 484,262
Int. Cl.² C07D *301/02*
U.S. Cl. 260—348 R **9 Claims**

1. A process for the preparation of an oxirane compound from the corresponding olefin which comprises the steps of:
   a. forming a vicinal halohydrin having from 2 to 30 carbon atoms per molecule of the formula



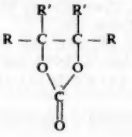
wherein each R and R′ is individually selected from the group consisting of hydrogen and hydrocarbyl radical groups having from 1 to 10 carbon atoms and wherein both R′ groups in said halohydrin can represent a divalent aliphatic hydrocarbon radical which together with the carbon atoms to which the —X and the —OH groups are attached can form a cycloaliphatic ring, and X is selected from the group consisting of chlorine, bromine and iodine, by reacting the corresponding olefin of the formula



wherein R and R′ are as defined above, with oxygen in the presence of an iron halide and a copper halide, under reaction conditions, wherein there is formed as a coproduct, an iron oxide;

b. separately recovering from step (a), said vicinal halohydrin and said iron oxide;

c. reacting said vicinal halohydrin, an amine and carbon dioxide, under reaction conditions, to form a cyclic carbonate ester having from 3 to 31 carbon atoms per molecule of the formula



wherein R and R′ are as defined above, wherein there is formed as a coproduct an amine hydrohalide;

d. separately recovering from step (c) said ester and said amine hydrohalide;

e. decomposing said ester to form the corresponding oxirane compound and carbon dioxide; and

f. separately recovering from step (e) said carbon dioxide and said oxirane compound as a product of the process.

3,923,843

EPOXIDATION PROCESS WITH IMPROVED HETEROGENEOUS CATALYST

Harald P. Wulff, Alameda, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 234,301, March 13, 1972, Pat. No. 3,829,392, which is a continuation-in-part of Ser. No. 77,385, Oct. 1, 1970, abandoned. This application Dec. 7, 1973, Ser. No. 422,950

Int. Cl.² C07D *301/20*

U.S. Cl. 260—348.5 L **18 Claims**

1. A process for the epoxidation of an olefinically unsaturated compound which comprises reacting the olefinically unsaturated compound in the liquid phase with an organic hydroperoxide at a temperature of from about 25°C to about 200°C in the presence of a catalyst prepared by reacting an olefin epoxidation catalyst comprising an inorganic siliceous solid in chemical combination with an oxide or hydroxide of titanium with an organic silylating agent at an elevated silylation temperature in the range from about 100° to about 450°C for from about 0.1 to 48 hours.

3,923,844

PROCESS FOR THE PREPARATION OF 4,4,4-TRICHLORO-1,2-EPOXYBUTANE

Philip M. Pivawer, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed July 29, 1974, Ser. No. 492,576

Int. Cl.² C07D *301/26*

U.S. Cl. 260—348.6 **13 Claims**

1. In a process for preparing 4,4,4-trichloro-1,2-epoxybutane which comprises reacting 2,4,4,4-tetrachlorobutanol or 2-bromo-4,4,4-trichlorobutanol with an aqueous solution of basic dehydrohalogenating agent selected from the group consisting of an alkali metal hydroxide and an alkaline earth metal hydroxide, the improvement wherein said reaction is carried out in the presence of an emulsion-inhibiting proportion of an anti-oxidant selected from the group consisting of an alkali metal bisulfite, catechol and 4-alkyl catechol in which said alkyl group contains from 1 to 8 carbon atoms.

3,923,845

RECOVERY OF PURIFIED 1-NITROANTHRAQUINONE

Karl-Heinz Bantel, Ludwigshafen; Heinz Eilingsfeld, Frankenthal, and Guenter Stoeckelmann, Frankenthal-Moersch, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 2, 1973, Ser. No. 384,834

Claims priority, application Germany, Aug. 2, 1972, 2237904

Int. Cl.² C07C *79/37*

U.S. Cl. 260—369 **6 Claims**

1. A process for the recovery of 1-nitroanthraquinone in a purified state from a crude nitroanthraquinone mixture containing dinitroanthraquinones and at least 60% by weight of said 1-nitroanthraquinone, which process comprises:

heating said crude mixture at 70° to 150°C. in one-half to 10 times its weight of an organic solvent which may contain up to 10% by weight of water and is selected from the group consisting of halogenated aliphatic or aromatic hydrocarbons, anisole, nitrobenzene, N,N-dimethylpropionamide, N,N-dimethylformamide, N-methylpyrrolidone, dimethylsulfoxide, hexamethylphosphoric triamide and benzonitrile, with a base consisting essentially of 0.3 to 3 moles per mole of dinitroanthraquinone of a tertiary amine selected from the group consisting of trimethylamine, triethylamine, tripropylamine, tributylamine, triethanolamine, pyridine, N,N-dimethylaniline, N,N-diethylaniline, N-methylmorpholine, N-ethylpiperidine, N-methyldiisopropylamine, N-methyl-diisobutylamine and tetramethylhexamethylendiamine in the presence of 0.1 to 10% by weight, with reference to the crude mixture, of an initiator selected from the group consisting of alkali metal nitrite, alkaline earth metal nitrite, alkali metal thiocyanate, alkali metal halides and alkaline earth metal halides;

cooling the reaction mixture after completion of the reaction; and

separating the pure 1-nitroanthraquinone from the reaction mixture.

3,923,846

MICHAEL-TYPE ADDITION PRODUCTS OF NITROPARAFFINS

Wheller C. Crawford, Fishkill; William P. Doyle, Lagrangeville, and John A. Patterson, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 836,940, June 26, 1969, abandoned. This application June 29, 1972, Ser. No. 267,320

Int. Cl.² C07C *69/00*; C08K *5/09*

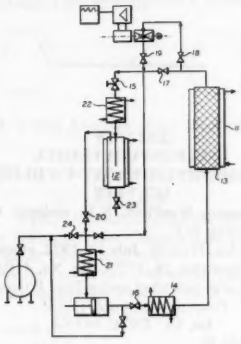
U.S. Cl. 260—404 **1 Claim**

1. β-(2-carbonylmethoxyethyl) secondary C_{10}–C_{14} nitroparaffins.

3,923,847
METHODS OF PRODUCING COCOA BUTTER

Wilhelm Rosellus, Bremen-St. Magnus; Otto Vitzthum, Bremen, and Peter Hubert, Bremen-Lesum, all of Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Filed May 23, 1973, Ser. No. 363,098
Int. Cl.² C11B *1/10*
U.S. Cl. 260—412.8 **9 Claims**



1. A method for the production of cocoa butter from cocoa mass or from roasted or unroasted cocoa nibs comprising the step of contacting said cocoa product with a food-acceptable solvent gas which is supercritical in respect of temperature and pressure for extraction of said cocoa butter by the solvent gas, and removing the solvent gas bearing the cocoa butter from the residue of said cocoa product.

3,923,848
PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT ALIPHATIC CARBOXYLIC ACIDS BY CHROMOSULFURIC ACID OXIDATION OF α-OLEFINS

Hans Schmidt, and Werner Strabberger, both of Gersthofen, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 19, 1974, Ser. No. 498,567
Claims priority, application Germany, Aug. 24, 1973, 2342823
Int. Cl.² C11C *1/00*
U.S. Cl. 260—413 **2 Claims**

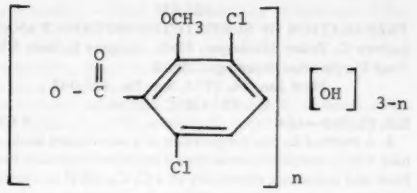
1. A process for preparing saturated, high molecular weight, aliphatic monocarboxylic acids by oxidizing in the molten state α-olefins having from 16 to 70 carbon atoms in the molecule or mixtures of such olefins by means of aqueous chromo-sulfuric acid, which comprises adding to the molten olefins or mixtures of olefins prior to oxidizing from 2 to 15 % by weight, calculated on the olefins, of saturated aliphatic mono- or dialcohols having from 10 to 40 carbon atoms in the molecule, or their fatty acid esters, and then oxidizing with the aqueous chromosulfuric acid at a temperature of 60° to 180°C.

3,923,849
ALUMINUM SALTS OF 2-METHOXY-3,6-DICHLOROBENZOIC ACID

Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Oct. 29, 1973, Ser. No. 410,750
Int. Cl.² C07F *5/06*
U.S. Cl. 260—448 R **3 Claims**

1. A compound of the formula



wherein *n* is the integer 1 or 2.

3,923,850
PREPARATION OF AROMATIC ISOCYANATES

Ehrenfried H. Kober, Aschau near Krailburg, Upper Bavaria, and Wilhelm J. Schnabel, Branford, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 12, 1969, Ser. No. 806,728
Int. Cl.² C07C *118/06*
U.S. Cl. 260—453 PC **19 Claims**

1. In the process for preparing an aromatic isocyanate by reacting an aromatic nitro compound containing up to about 20 carbon atoms with carbon monoxide at an elevated temperature and an elevated pressure, the improvement which comprises carrying out the reaction in the presence of a mixture of

I. a hydroxyl-substituted hydrocarbon selected from the groups consisting of
  a. aliphatic alcohols containing from 1 to 12 carbon atoms
  b. phenols containing from 6 to 10 carbon atoms in the ring
  c. alkyl-substituted phenols containing from 7 to 14 carbon atoms and
  d. aliphatic diols containing from 1 to 4 carbon atoms,

II. a catalyst system selected from the group consisting of
  a. a noble metal compound selected from the group consisting of noble metal halides or noble metal oxides, wherein the noble metal is selected from the group consisting of palladium, rhodium, iridium, ruthenium or mixtures thereof,
  b. a mixture of
    1. a noble metal compound of IIa and
    2. a heteroaromatic nitrogen compound having a ring containing
      a. 5 or 6 members in the ring,
      b. only nitrogen and carbon in the ring,
      c. no more than 2 nitrogen atoms in the ring, and
      d. at least 2 double bonds in the ring,
  c. a complex of a noble metal compound of IIa with a heteroaromatic nitrogen compound of IIb(2) and
  d. a mixture of
    1. a noble metal compound of IIa, and
    2. an oxide of an element selected from the group consisting of
      a. molybdenum,
      b. vanadium,
      c. chromium and
      d. iron,

III. wherein the proportion of said hydroxyl substituted hydrocarbon is between about 0.001 and about 20 mole equivalents per mole of said aromatic nitro compound.

3,923,851

PREPARATION OF SUBSTITUTED ISOTHIOCYANATES

Andrew G. Zeiler, Muskegon, Mich., assignor to Story Chemical Corporation, Muskegon, Mich.

Filed Jan. 14, 1974, Ser. No. 433,048
Int. Cl.[2] C07C *161/04*
U.S. Cl. 260—454 8 Claims

1. A method for the preparation of a substituted isothiocyanate which comprises contacting a reaction admixture formed from and consisting essentially of a C_1-C_{30} alkyl or cycloalkyl primary amine, carbon disulfide and a non-aqueous, low molecular weight, waterimmiscible halogenated hydrocarbon or an aromatic hydrocarbon as a solvent for the substituted isothiocyanate with gaseous oxygen in the presence of activated carbon as an oxidation catalyst and at a temperature in the range 5°–30°C. and recovering from the resulting reaction admixture a substituted isothiocyanate.

3,923,852

PREPARATION OF SUBSTITUTED ISOTHIOCYANATES

Andrew G. Zeiler, Muskegon, and Harry Babad, North Muskegon, both of Mich., assignors to Story Chemical Corporation, Muskegon, Mich.

Filed Jan. 14, 1974, Ser. No. 433,046
Int. Cl.[2] C07C *161/04*
U.S. Cl. 260—454 10 Claims

1. A method for the preparation of a substituted isothiocyanate which comprises contacting a reaction admixture formed from and consisting essentially of a C_1–C_{30} alkyl or cycloalkyl primary amine, a normally liquid water-immiscible halogenated hydrocarbon or an aromatic hydrocarbon as a solvent for said substituted isothiocyanate and carbon disulfide with gaseous oxygen, the reaction admixture during contact with the gaseous oxygen having incorporated therein a catalytic amount of a metal oxidation catalyst selected from the group consisting of manganese, iron, copper, zinc, nickel and cobalt compounds, the contacting of said admixture being carried out at a temperature in the range 5°–30°C. and recovering from the resulting reaction admixture the substituted isothiocyanate.

3,923,853

PREPARATION OF SUBSTITUTED ISOTHIOCYANATES

Andrew G. Zeiler, Muskegon, Mich., assignor to Story Chemical Corporation, Muskegon, Mich.

Filed Jan. 14, 1974, Ser. No. 433,049
Int. Cl.[2] C07C *161/04*
U.S. Cl. 260—454 7 Claims

1. A method for the preparation of a substituted isothiocyanate which comprises contacting a reaction admixture formed from and consisting essentially of a C_1–C_{30} alkyl or cycloalkyl primary amine, carbon disulfide and an aqueous alkali metal hydroxide solution with gaseous oxygen in the presence of an oxidation catalyst and at a temperature in the range 5°–30°C. and recovering from the resulting admixture a substituted isothiocyanate.

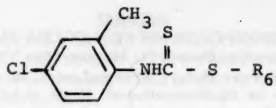
3,923,854

DERIVATIVES OF THIOCARBAMIC ACID, THEIR MANUFACTURE AND THEIR USE FOR COMBATING INSECTS AND REPRESENTATIVES OF THE ORDER ACARINA

Dieter Duerr, Bottmingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed May 4, 1970, Ser. No. 34,561
Claims priority, application Switzerland, May 8, 1969, 7084/69
Int. Cl.[2] C07C *153/11*
U.S. Cl. 260—455 A 9 Claims

1. A compound of the formula



in which R_6 is alkyl of from 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms or a chloroalkenyl of 3 or 4 carbon atoms.

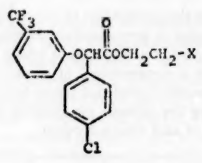
3,923,855

2-SULFONYLOXYETHYL 3-TRIFLUOROMETHYLPHENOXY-4'-CHLOROPHENYL ACETATE

Richard F. Shuman, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 271,446, July 13, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 410,062
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C07C *143/68*
U.S. Cl. 260—456 R 3 Claims

1. A compound of the formula:



wherein X is lower alkylsulfonyloxy or lower alkyl substituted phenylsulfonyloxy.

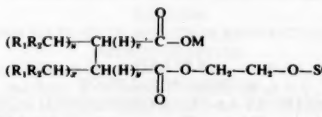
3,923,856

PHOSPHATE-FREE CARBOXYLATE-SULFATE DETERGENTS

Mitchell Danzik, Pinole, and Ralph House, El Sobrante, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 259,924, June 5, 1972, Pat. No. 3,843,707. This application July 11, 1974, Ser. No. 483,261
Int. Cl.[2] C07C *141/02*
U.S. Cl. 260—458 4 Claims

1. A surface active compound of the formula:



in which R_1 and R_2 are substantially linear alkyl groups of 3 to 19 carbon atoms, u, v, x and y are 0 or 1, M is H or an alkali metal, alkaline earth metal, or ammonium cation, the sum of the carbon atoms in R_1 and R_2 is 13 to 21, the sum of u and v is 1, the sum of x and y is 1, and the sum of u and x is 1.

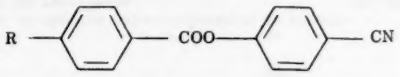
3,923,857

LIQUID CRYSTAL ESTERS

Arthur Boller, Binningen, and Hanspeter Scherrer, Therwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 21, 1973, Ser. No. 334,291
Claims priority, application Switzerland, Feb. 23, 1972, 2586/72; Jan. 23, 1973, 920/73
Int. Cl.² C07C *121/64*
U.S. Cl. 260—465 D 6 Claims

1. A compound of the formula



wherein R is straight-chain lower alkyl of 4 to 8 carbon atoms.

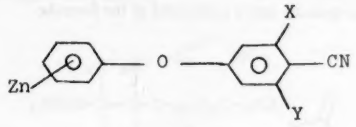
3,923,858

PHENOXYBENZONITRILES

Robert James Theissen, Union County, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 69,959, Sept. 4, 1970, abandoned. This application Feb. 23, 1973, Ser. No. 335,408
Int. Cl.² C07C *121/75*
U.S. Cl. 260—465 F 5 Claims

1. A compound having the formula:



wherein X is hydrogen, Y is halogen or lower alkyl, Z is halogen and *n* is an integer of from 1 to 3.

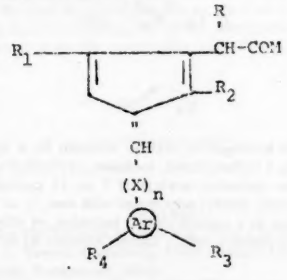
3,923,859

SUBSTITUTED FULVENE ACETIC ACIDS AND DERIVATIVES

Tsung-Ying Shen, Westfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 31, 1973, Ser. No. 393,513
Int. Cl.² C07C *121/48*
U.S. Cl. 260—465 D 4 Claims

1. A compound of the formula:



wherein:

R and R_2 are each hydrogen or alkyl;

R_1, R_3 and R_4 are each hydrogen, halogen, alkyl, alkoxy, amino, alkenyloxy, alkylamino, dialkylamino, alkylthio, alkylsulfinyl, alkylsulfonyl, trihaloalkyl, dialkylaminoalkyl, dialkylaminoalkoxy, cyano, alkanoyl, nitro, hydroxy, alkanoyloxy, alkanoylamino, aminoalkyl, alkylaminoalkyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, aryl, aryloxy, aralkyl, —SO_3H or sulfonamido; at least one of R_1, R_3 or R_4 being cyano;

AR is phenyl; and

M is hydroxy, alkoxy or NR′R″ wherein R′ and R″ are each hydrogen or C_{1-5} alkyl;

X is alkylene, alkenylene, alkynylene, O, S, carbonyl, sulfinyl, sulfonyl, or NR_5 wherein R_5 is hydrogen or alkyl; and *n* is 0 or 1.

3,923,860

VAPOR PHASE CHLORINATION OF ACETONITRILE IN THE PRESENCE OF WATER

Sven H. Ruetman, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1974, Ser. No. 495,711
Int. Cl.² C07C *120/00*
U.S. Cl. 260—465.7 4 Claims

1. A vapor phase chlorination process for the production of dichloro- and trichloroacetonitrile, comprising introducing into a reaction zone one molecular proportion of acetonitrile vapors, from about 6 to about 100 molecular proportions of chlorine gas and from about one to about 50 molecular proportions of steam, under conditions of flow such that rapid mixing results and the Reynolds number at the point of mixing is at least 800, and maintaining the resultant mixture in said zone at a temperature within the range of from about 350° to about 500°C. for a period of from about 2 to about 50 seconds.

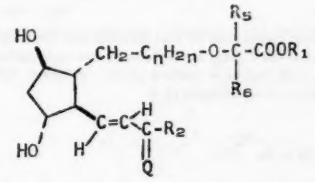
3,923,861

3-OXA PROSTAGLANDIN F β-TYPE COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 332,067, Feb. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 47,169, June 17, 1970, abandoned. This application Apr. 17, 1974, Ser. No. 461,508
Claims priority, application United Kingdom, July 29, 1969, 38073/69
Int. Cl.² C07C *61/38, 69/74*
U.S. Cl. 260—468 D 70 Claims

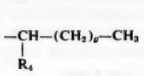
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_nH_{2n} is alkylene of one to 10 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, between —CH_2— and —O—; wherein Q is

or

wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is



wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; wherein R_5 and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,923,862

4-OXA PROSTAGLANDIN B-TYPE COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

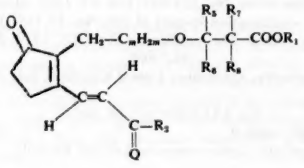
Continuation of Ser. No. 332,079, Feb. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 47,169, June 17, 1970, abandoned. This application Apr. 17, 1974, Ser. No. 461,489

Claims priority, application United Kingdom, July 29, 1969, 38073/69

Int. Cl.[2] C07C *61/38, 69/74*

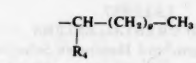
U.S. Cl. 260—468 D **38 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_mH_{2m} is alkylene of one to 9 carbon atoms, inclusive, with one to 4 carbon atoms, inclusive, between —CH_2— and —O—; wherein Q is

wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is



wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; and wherein R_5, R_6, R_7, and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,923,863

4-OXA PROSTAGLANDIN A-TYPE COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

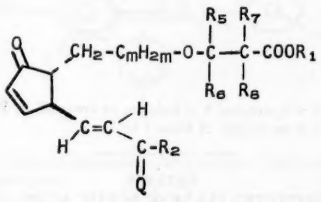
Continuation of Ser. No. 332,279, Feb. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 47,169, June 17, 1970, abandoned. This application Apr. 17, 1974, Ser. No. 461,496

Claims priority, application United Kingdom, July 29, 1969, 38073/69

Int. Cl.[2] C07C *61/38, 69/74*

U.S. Cl. 260—468 D **38 Claims**

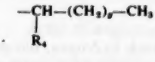
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_mH_{2m} is alkylene of one to 9 carbon atoms, inclusive, with one to 4 carbon atoms, inclusive, between —CH_2— and —O—; wherein

or

wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is



wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; wherein R_5, R_6, R_7, and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof, wherein R_1 is hydrogen.

3,923,864

3-OXA PROSTAGLANDIN A-TYPE COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

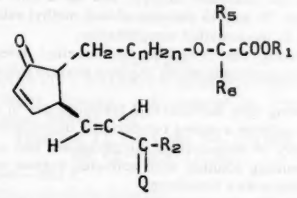
Continuation of Ser. No. 332,279, Feb. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 47,169, June 17, 1970, abandoned. This application Apr. 17, 1974, Ser. No. 461,498

Claims priority, application United Kingdom, July 29, 1969, 38073/69

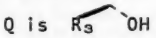
Int. Cl.[2] C07C *61/38, 69/74*

U.S. Cl. 260—468 D 38 Claims

1. An optically active compound of the formula:

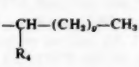


or a racemic compound of that formula and the mirror image thereof, wherein C_nH_{2n} is alkylene of 1 to 10 carbon atoms, inclusive, with 1 to 5 carbon atoms, inclusive, between —CH_2— and —O—; wherein



or

wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with 1, 2, or 3chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is



wherein R_4 is hydrogen or fluoro and g is 1, 2, 3, 4, or 5; and wherein R_5 and R_6 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,923,865

4-OXA PROSTAGLANDIN Fβ-TYPE COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

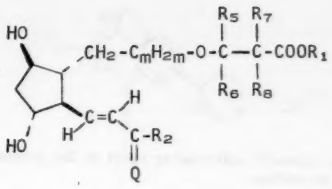
Continuation of Ser. No. 332,067, Feb. 13, 1973, abandoned, and a continuation-in-part of Ser. No. 47,169, June 17, 1970, abandoned. This application Apr. 17, 1974, Ser. No. 461,597

Claims priority, application United Kingdom, July 29, 1969, 38073/69

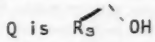
Int. Cl.[2] C07C *11/78, 64/94*

U.S. Cl. 260—468 D 70 Claims

1. An optically active compound of the formula:

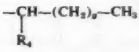


or a racemic compound of that formula and the mirror image thereof, wherein C_mH_{2m} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 4 carbon atoms, inclusive, between —CH_2— and —O—; wherein



or

wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is



wherein R_4 is hydrogen or fluoro and g is 1, 2, 3, 4, or 5; wherein R_5, R_6, R_7, and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,923,866

PROCESS FOR PRODUCING INDAN DERIVATIVES

Yoichi Sawa, Osaka; Toshinori Hattori, Suita; Susumu Katsube, and Akitoshio Goto, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Japan

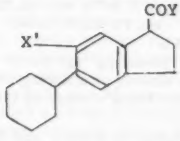
Filed June 19, 1973, Ser. No. 371,525

Claims priority, application Japan, June 19, 1972, 47-61140; Nov. 21, 1972, 47-117021

Int. Cl.[2] C07C *63/595*

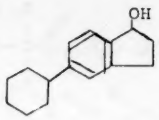
U.S. Cl. 260—469 4 Claims

1. A process for producing a compound of the formula:

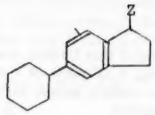


(VIII)

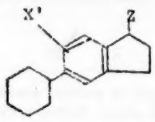
wherein X' stands for a halogen atom and Y stands for a hydroxyl group, an amino group or an alkoxy group having 1 to 6 carbon atoms, which comprises reacting:


(II)

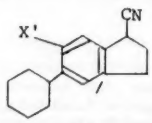
with an aromatic sulfonylating agent in the presence of a solvent to produce


(III)

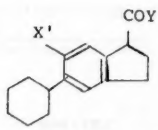
wherein Z stands for an aryl sulfonyloxy group, which is then reacted with a halogen, sulfuryl halide, N-bromosuccinimide or N-chlorosuccinimide in the presence of a solvent at a temperature not exceeding 100°C to produce


(IV)

wherein X′ and Z have the same meaning as above, which is then reacted with an alkali metal cyanide in the presence of a solvent to produce


(VI)

wherein X′ has the same meaning as above, which is then subjected to hydrolysis or to alcohol addition with subsequent hydrolysis to produce


(VIII)

wherein X′ and Y have the same meaning as above.

3,923,867

METHOD FOR PRODUCING MONOMETHYL TEREPHTHALATE

Manfred Baerns; Bruno Beck; Karl Ludwig Schmid; Hubert Machacek; Gunther Beige, and Heinz Nogge, all of Essen, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 5, 1972, Ser. No. 259,979
Int. Cl.[2] C07C *69/82*
U.S. Cl. 260—475 R **4 Claims**

1. Method for producing high-purity monomethyl terephthalate suitable directly as a starting product for the production of polyester fibers, comprising the following process steps:

a. oxidizing p-xylene to p-toluic acid by reacting said p-xylene with an oxygen containing gas in a gas-liquid contact system at a temperature between 90° and 130°C, a pressure between 3 and 15 atmospheres, in the presence of a polyvalent heavy metal salt as the oxidation catalyst, and for a time such that the conversion of said p-xylene to said p-toluic acid is between 15 and 60 percent;

b. reacting the p-toluic acid from step (a) with methanol in a first esterification stage at a temperature between 150° and 230°C and a pressure between 15 and 60 atmospheres and then reacting the residual p-toluic acid substantially completely to p-toluic acid methyl ester by countercurrent contact with gaseous methanol at temperatures between 220° and 260°C and pressures at which said methanol is substantially in vapor form;

c. oxidizing p-toluic acid methyl ester from step (b) with an oxygen containing gas in a gas-liquid system at a temperature between 140° and 170°C, pressures from 1 up to 6 atmospheres, in the presence of a polyvalent heavy metal salt as the oxidation catalyst, and for a time such that between 20 and 45 percent of said methyl ester is converted to monomethyl terephthalate;

d. separating the crystalline monomethyl terephthalate reaction product from the reaction mixture following step (c);

e. dissolving said monomethyl terephthalate in a solvent which exhibits a strong temperature dependence for the solubility of monomethyl terephthalate, and contacting the resulting solution with activated carbon to remove color impurities therefrom;

f. cooling the thus-treated solution to recrystallize the monomethyl terephthalate therefrom; and

g. recovering the resulting high-purity monomethyl terephthalate product.

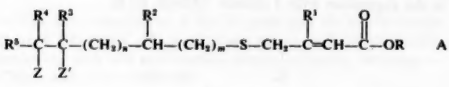
3,923,868

SUBSTITUTED ALKYLTHIO BUTENOIC ACIDS AND ESTERS

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed June 6, 1973, Ser. No. 367,613
Int. Cl. C07c *149/20*
U.S. Cl. 260—481 R **11 Claims**

1. A compound selected from those of the following formula A:


A

wherein,

R is hydrogen, lower alkyl, lower alkenyl or lower alkynyl; each of R^1, R^2, R^4 and R^5 is lower alkyl;

R^3 is hydrogen or methyl;

n is one or two;

m is zero, one, or two;

Z is OR^6 in which R^6 is hydrogen, lower alkyl or acetyl; and Z′ is hydrogen.

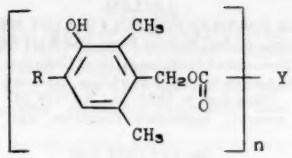
3,923,869

4-ALKYL-2,6-DIMETHYL-3-HYDROXYBENZYL ESTERS OF 3,3′-DIPROPIONIC ACID

John Song, Bound Brook, and Henry Richmond, Whitehouse Station, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 123,001, March 10, 1971, Pat. No. 3,795,700. This application May 24, 1973, Ser. No. 363,439
Int. Cl.[2] C07C *149/20*
U.S. Cl. 260—481 R **2 Claims**

1. A compound of the formula:



wherein R is a branched chain alkyl group containing 3 to about 12 carbon atoms; Y is the residue of the carboxylic acid $Y(COOH)_n$ which is 3,3'-thiodipropionic acid; and *n* is 2.

3,923,870

URETHANES OF 1-HALOGEN SUBSTITUTED ALKYNES

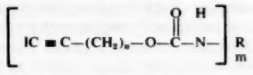
William Singer, Teaneck, N.J., assignor to Troy Chemical Corporation, Newark, N.J.

Filed July 11, 1973, Ser. No. 378,089

Int. Cl.² C07C *125/06*

U.S. Cl. 260—482 C **11 Claims**

1. Compounds of the formula



in which R is an alkyl group having one to not more than 20 carbon atoms and having from one to three linkages corresponding to *m* and *n* and *m* are whole number integers between 1 and 3 and may be the same or different.

3,923,871

CYCLOPROPYLMETHYL ESTERS

Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

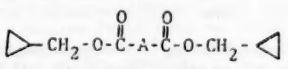
Continuation-in-part of Ser. No. 263,902, June 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 255,368, May 22, 1972, abandoned. This application Apr. 13, 1973, Ser. No. 350,708

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07C *69/34, 69/52*

U.S. Cl. 260—485 L **9 Claims**

1. A compound of the formula



wherein A is alkylene of 1 to 20 carbon atoms, alkenylene of 2 to 20 carbon atoms, or alkynylene of 2 to 20 carbon atoms.

3,923,872

NEW CYCLOPENTANE DERIVATIVES

Michael Peter Lear Caton, Upminster, and Trevor Parker, Romford, both of England, assignors to May & Baker Limited, Essex, England

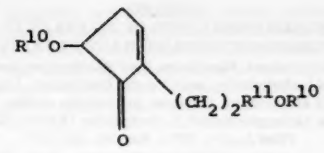
Filed Feb. 15, 1973, Ser. No. 332,660

Claims priority, application United Kingdom, Feb. 18, 1972, 7640/72

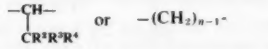
Int. Cl.² C07C *49/58, 69/08, 69/16, 69/28*

U.S. Cl. 260—488 R **9 Claims**

1. A cyclopentenone of the formula:



wherein both symbols R^{10} represent hydrogen or identical alkanoyl groups of 1 through 5 carbon atoms, and R^{11} represents a divalent group of the formula:



wherein R^2 and R^3 represent hydrogen or alkyl of 1 through 4 carbon atoms, R^4 represents hydrogen or alkyl of 1 through 10 carbon atoms and *n* represents 4 or 6.

3,923,873

BICYCLIC COMPOUNDS, THEIR USE AND PROCESS FOR PREPARING SAME

Bruno Maurer, Collonge-Bellerive; Michel G. Fracheboud, and Gunther Ohloff, both of Bernex-Geneva, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

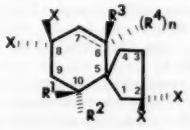
Filed May 23, 1973, Ser. No. 363,187

Claims priority, application Luxembourg, July 17, 1972, 65737; May 29, 1972, 65431

Int. Cl.² C07C *35/21, 69/14, 69/145*

U.S. Cl. 260—488 R **8 Claims**

1. Bicyclic compounds of the formula:



wherein one of the X symbols in either position 2 or position 8 represents a single hydroxyl or O-acetyl group and the remaining three X symbols represent hydrogen atoms and wherein the linkage between position 6 and position 7 is a single or double bond relationship, the index *n* represents the integers zero or 1 and wherein:

i. one of the symbols R^1 and R^2 represents a lower alkyl group and the other is a hydrogen atom and R^3 represents a lower alkyl group when the index n is zero; or

ii. each of the symbols R^1, R^2, R^3, and R^4 represents a lower alkyl group or a hydrogen atom provided however that the pairs R^1 and R^2 and R^3 and R^4, respectively, cannot simultaneously have more than one alkyl group.

3,923,874

CONTINUOUS PRODUCTION OF ESTERS OF GLYCOLS OR THEIR MONOETHERS WITH LOWER FATTY ACIDS

Heinz Hohenschutz, Mannheim; Paul Hornberger; Josef Gnad, both of Ludwigshafen, and Guenter Dinkhauser, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 6, 1973, Ser. No. 367,327

Claims priority, application Germany, June 10, 1972, 2228335

Int. Cl.² C07C 67/08

U.S. Cl. 260—496 10 Claims

1. A process for the continuous production of wholly or substantially water-soluble esters of glycols or of their monoethers with lower fatty acids, which process comprises:

reacting in a first zone a glycol of the formula

$$HO-A-X \quad (I)$$

in which A is ethylene, propylene or butylene, and X is OH, OR, OAOH or OAOR wherein R is alkyl of one to four carbon atoms and A has the above meaning, with a lower saturated fatty acid at an elevated temperature and in the presence of a catalytic amount of a strong acid while the water formed in the reaction is simultaneously distilled off azeotropically over the top by means of an entrainer which forms an azeotrope with water selected from the group consisting of hydrocarbons and lower fatty acid esters of alkanols of 1 to 5 carbon atoms, said entrainer being continuously introduced into said first zone and the crude glycol ester mixed with entrainer being continuously withdrawn from the bottom of said first zone;

continuously adding aqueous alkali to the crude glycol ester withdrawn from said first zone;

then continuously extracting the crude glycol ester in a second zone to which there is continuously supplied water and additional entrainer as the extractant with phase separation into an aqueous phase and an organic phase;

continuously separating said organic phase from said aqueous phase; and

continuously recovering the pure glycol ester from said organic phase by rectification in a third zone.

3,923,875

PROCESS FOR PRODUCING ALKADIENOL ESTERS

David Rose, Dusseldorf-Holthausen, and Herbert Lepper, Cologne-Mulheim, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed July 10, 1972, Ser. No. 270,089

Claims priority, application Germany, July 26, 1971, 2137291

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07C 67/04

U.S. Cl. 260—497 A 15 Claims

3. A process for producing alkadienol esters comprising the steps for reacting a 1,3-conjugated acyclic diolefin of 4 to 10 carbon atoms with a carboxylic acid selected from the group consisting of alkanoic acids of 2 to 12 carbon atoms, benzene dicarboxylic acids, cycloalkyl carboxylic acids of 5 to 8 carbon atoms, benzoic acid, alkanedioic acids of 2 to 12 carbon atoms by mixed oligomerization, in the presence of from 0.1 to 6 parts by weight, based on the weight of said diolefin, of a catalyst combination consisting essentially of (1) a member selected from the group consisting of (a) palladium, (b) palladium (II) compounds and (c) the mixtures thereof and (2) a triphenylphosphite containing at least 3 ortho substituents selected from the group consisting of amino, nitro, alkyl of 1 to 12 carbon atoms, haloalkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, phenylalkyl of 7 to 12 carbon atoms, lower alkenyl, and halophenyl; and recovering said alkadienol esters.

3,923,876

COMPLEX FORMERS FOR POLYVALENT METAL IONS

Arnold Heins, Hilden; Helmut Blum, and Karl-Heinz Worms, both of Duesseldorf-Holthausen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

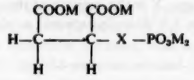
Filed Apr. 9, 1973, Ser. No. 349,347

Claims priority, application Germany, Apr. 13, 1972, 2217692

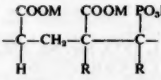
Int. Cl.² C07F 9/38

U.S. Cl. 260—502.4 R 10 Claims

1. A compound of the formula



wherein X is selected from the group consisting of



wherein M is selected from the group consisting of hydrogen, alkali metal and ammonium and R is selected from the group consisting of hydrogen, or alkyl radical with 1 to 4 carbon atoms and a phenyl radical and complexes thereof with alkaline earth metal ions.

3,923,877

PREPARATION OF N-PHOSPHONOMETHYL GLYCINE

John Edward Duncan Barton, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 11, 1973, Ser. No. 405,258

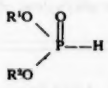
Claims priority, application United Kingdom, Nov. 8, 1972, 51442/72

Int. Cl.² C07F 9/38

U.S. Cl. 260—502.5 4 Claims

1. A process of preparing the compound N-phosphonomethyl glycine, having the formula:

which comprises (a) reacting 1,3,5-tricyanomethylhexahydro-1,3,5-triazine with an ester of phosphorous acid having the formula:



wherein R^1 and R^2 are hydrocarbyl or substituted hydrocarbyl radicals in which the substituent is inert to the reaction, at a temperature in the range from 15° to 100°C and in the presence of a catalyst selected from the group consisting of hydrogen halides, Lewis acids, alkanoic acid halides, and alkanoic acid anhydrides, to form an ester of N-phosphonomethylglycinonitrile, (b) recovering the ester of N-phosphonomethylglycinonitrile from the reaction mixture, (c) hydrolysing the ester of the N-phosphonomethylglycinonitrile and (d) recovering N-phosphonomethylglycine.

3,923,878

DISTYRYLBENZENE DERIVATIVES

Hans Rudolf Meyer, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed May 18, 1972, Ser. No. 254,708

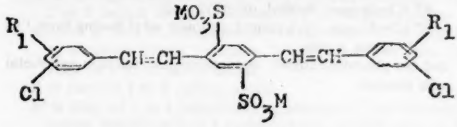
Claims priority, application Switzerland, June 7, 1971, 8327/71

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C07C *143/24*

U.S. Cl. 260—505 C 4 Claims

1. New distyrylbenzene derivatives of the formula



wherein R_1 represents hydrogen or chlorine and, if R_1 represents chlorine, the chlorine atoms assume the positions 2, 4 or 3, 4, and M denotes a hydrogen atom, an alkali metal ion or an ammonium ion.

3,923,879

PROCESS FOR PREPARING 4-AMINOMETHYL CYCLOHEXANE CARBOXYLIC ACID-1

Hirataka Itoh; Yutaka Usubuchi; Chisei Shibuya, and Koryo Itoh, all of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19, 1973, Ser. No. 416,793

Claims priority, application Japan, Nov. 29, 1972, 47-119039

Int. Cl.[2] C07C *99/100*

U.S. Cl. 260—514 J 9 Claims

1. A method for producing 4-aminomethyl cyclohexane carboxylic acid-1 which is characterized in that a low alkyl ester of p-cyanobenzoic acid is reduced at a temperature of from about 10°C to 250°C in a hydrogen atmosphere at a pressure of from about 10 to 200 atmospheres in the presence of a nickel catalyst in an aqueous medium containing ammonia together with at least one alkali metal or alkaline earth metal hydroxide, and from 0.1 to 50 mol per mol of p-cyanobenzoic acid of at least one straight chain, branched chain or cyclic alcohol or ether.

3,923,880

CATALYSTS AND CATALYTIC PROCESSES

David Jack Westlake, Ewell, Epsom, and Michael John Wrigglesworth, Horsham, both of England, assignors to BP Chemicals International Limited, London, England

Filed Oct. 10, 1972, Ser. No. 295,860

Claims priority, application United Kingdom, Oct. 20, 1971, 48777/71; Dec. 20, 1971, 58991/71

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C07C *51/12, 51/10, 67/00*

U.S. Cl. 260—532 14 Claims

1. A process for the carbonylation of an alcohol or an alcohol derivative chosen from the group consisting of esters, symmetrical ethers and alkyl halogens containing from 1 to 20 carbon atoms per molecule in the alcohol moiety to produce a carboxylic acid having one more carbon atom per molecule than that in the alcohol moiety of the alcohol or alcohol derivative comprising reacting said alcohol or said alcohol derivative with carbon monoxide at a temperature between 50° and 300°C in the presence of a cationic complex catalyst selected from the group consisting of cationic complex of univalent rhodium, univalent iridium, trivalent rhodium and trivalent iridium, containing a stabilizing ligand selected from the group consisting of acetonitrile, benzonitrile, n-butyl isocyanate, benzene, toluene, hexamethyl benzene, an aryl phosphite or an aryl phosphine, and wherein the anionic moiety in the cationic complex catalyst is a radical selected from the group consisting of phosphates, sulphates, perchlorates, borates, iodates, and bromates, and optionally, a promoter selected from the group consisting of bromine, iodine, a hydrogen halide, an alkyl halide, an aryl halide, and a metal halide.

3,923,881

PROCESS FOR THE PREPARATION OF C_4 DICARBOXYLIC ACIDS FROM 2-BUTENE

Jawad H. Murib, and Charles E. Frank, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 197,495, Nov. 10, 1971, Pat. No. 3,792,086, which is a continuation-in-part of Ser. No. 99,283, Dec. 17, 1970, abandoned. This application Dec. 28, 1973, Ser. No. 429,407The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.

Int. Cl.[2] C07C *51/32, 55/10, 57/14*

U.S. Cl. 260—533 R 6 Claims

1. A process for the preparation of C_4 dicarboxylic organic acids which comprises oxidizing 2-butene in the vapor phase with molecular oxygen in the presence of a catalyst composition consisting essentially of phosphoric acid and a catalytically effective amount of at least one metal selected from the group consisting of palladium, platinum, rhodium, ruthenium, iridium, copper, silver, gold, cobalt, nickel, chromium and mixtures thereof.

3,923,882

PRODUCTION OF ACETIC ACID

Ben Wilton Kiff, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,731

Int. Cl.[2] C07C *51/16, 51/32*

U.S. Cl. 260—533 R 3 Claims

1. A continuous process for the liquid phase oxidation of butane to provide acetic acid comprising

a. admixing butane; a molecular oxygen-containing gas; initially a solvent comprising a carboxylic acid having 2 to 4 carbon atoms or a mixture of liquid products formed by the process; a cobalt catalyst; and ethanol in a reaction zone

wherein, at the beginning of each cycle, the amount of butane is in the range of about 5 percent by weight to about 150 percent by weight provided that there is a molar excess of hydrocarbon over oxygen; the amount of cobalt is in the range of about 0.03 percent by weight to about 3 percent by weight provided that the cobalt is in the form of a salt soluble in the solvent; and the amount of ethanol is about 1 percent by weight to about 20 percent by weight, said percentages based on the weight of the solvent, and

wherein the temperature is in the range of about 80°C to about 150°C; and the total reaction pressure and partial pressure of oxygen are sufficient to maintain the reaction in the liquid phase

to form a mixture of liquid products including acetic acid; and

b. passing the mixture of liquid products, the cobalt catalyst, and unreacted butane from step (a) into a separation zone

wherein a portion of the acetic acid is separated and recovered, and

wherein a portion of the mixture of liquid products in sufficient amount to provide solvent for step (a), the cobalt catalyst, and the unreacted butane are separated and recycled to the reaction zone.

3,923,883

METHOD FOR THE OXYCARBONYLATION OF OLEFINS

Wolfgang Gaenzler, Darmstadt-Eberstadt; Klaus Kabs, Seeheim, and Guenter Schroeder, Ober-Ramstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Continuation-in-part of Ser. No. 437,201, Jan. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 382,378, July 25, 1973, abandoned. This application May 8, 1974, Ser. No. 468,064

Claims priority, application Germany, May 12, 1973, 2324132

Int. Cl.[2] C07C *51/14*, *57/04*

U.S. Cl. 260—533 A 18 Claims

1. In the method for preparing α,β-unsaturated carboxylic acids by the oxidative carbonylation of an α-olefin with oxygen and carbon monoxide, in a substantially non-aqueous reaction medium in the presence of a catalytic amount of a catalyst soluble in said non-aqueous medium, the improvement wherein said catalyst consists essentially of a mixture of:

A. at least one compound of aluminum, silicon, phosphorus, or gallium, or of an alkaline earth metal, and

B. at least one compound of iron, copper, or of a metal of Groups IV B to VII B having an atomic weight up to 184.

3,923,884

PROCESS FOR PRODUCING DL-TARTARIC ACID

Eiichi Yonemitsu; Hiroshi Miyamori; Mutsuhiko Takeda, all of Chiba, and Yukio Sasaki, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,656

Claims priority, application Japan, Apr. 17, 1973, 46-43429

Int. Cl.[2] C07C *59/14*

U.S. Cl. 260—536 10 Claims

1. A process for producing dl-tartaric acid by hydrolysis of epoxysuccinic acid, comprising contacting an aqueous epoxysuccinic acid solution with a catalyst consisting essentially of activated charcoal, aluminum oxide or ferric oxide, and mixtures thereof said catalyst being substantially insoluble in said aqueous epoxysuccinic acid solution.

3,923,885

POLYFLUOROALKOXY-SUBSTITUTED AROMATIC CARBOXYLIC ACIDS

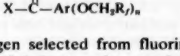
Arthur Mendel, Vadnais Heights, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 57,350, July 22, 1970, Pat. No. 3,766,247. This application Apr. 9, 1973, Ser. No. 349,237

Int. Cl.[2] C07C *65/08*, *63/02*, *65/14*

U.S. Cl. 260—544 M 7 Claims

1. A compound of the formula



wherein X is halogen selected from fluorine, chlorine and bromine, Ar is a naphthalene nucleus, each R_f is a fluorocarbon group containing from 1 to 3 carbon atoms and n is 1 to 3.

3,923,886

SULFAMIDES

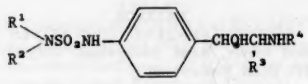
William T. Comer, and John D. Catt, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Sept. 20, 1973, Ser. No. 399,024

Int. Cl.[2] C07C *143/76*

U.S. Cl. 260—556 N 11 Claims

1. A compound selected from the group consisting of substances having the formula



wherein

R^1 is hydrogen, lower alkyl having from 1 to 4 carbon atoms, cyclopropyl, phenyl, or tolyl;

R^2 is hydrogen, lower alkyl having from 1 to 4 carbon atoms, cyclopropyl, or benzyl; or

R^1 and R^2 are joined to form with the nitrogen atom to which they are attached the 1-piperidyl group;

R^3 is hydrogen, methyl, or ethyl; and

R^4 is hydrogen, cyclopropyl, or lower alkyl having from 1 to 4 carbon atoms

and the pharmaceutically acceptable acid addition and metal salts thereof.

3,923,887

DERIVATIVES OF 2-AMINOINDANE, THE PREPARATION AND USE THEREOF

Pierre M. Vanhoof, and Pierre M. Clarebout, both of Brussels, Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

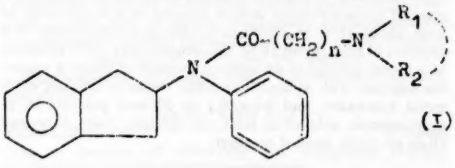
Filed Feb. 5, 1974, Ser. No. 439,773

Claims priority, application United Kingdom, Mar. 2, 1973, 10302/73; Feb. 5, 1973, 5631/73

Int. Cl.[2] C07C *103/38*

U.S. Cl. 260—562 N 5 Claims

1. New derivatives of 2-aminoindane of the general formula:



(I)

in which $n = 1$ or 2, R_1 represents hydrogen or a lower alkyl or hydroxyalkyl group containing 1 to 3 carbon atoms, R_2 represents a lower alkyl or hydroxyalkyl group containing 1 to 3 carbon atoms, whereby R_1 and R_2 may represent identical or different groups, as well as the acid addition salts of said new derivatives of 2-aminoindane.

3,923,888

AMINOPHENYLAMIDINES, THEIR PRODUCTION AND THEIR MEDICINAL USE

Hartmund Wollweber, Wuppertal, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

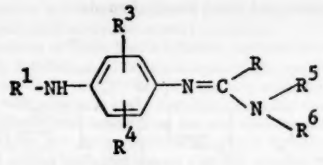
Division of Ser. No. 151,575, June 9, 1971, Pat. No. 3,855,292. This application Sept. 24, 1973, Ser. No. 399,813

Claims priority, application Germany, June 13, 1970, 2029299The portion of the term of this patent subsequent to Dec. 17, 1991, has been disclaimed.

Int. Cl.[2] C07C *123/00*

U.S. Cl. 260—564 RF 4 Claims

1. A compound of the formula:



wherein

R^1 is hydrogen, alkyl of 1 to 5 carbon atoms, alkoxyalkyl of 2 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

each of R^3 and R^4, independently of the other, is alkyl of 1 to 6 carbon atoms, or one is hydrogen and the other is alkyl of 1 to 6 carbon atoms;

R is alkyl of 1 to 5 carbon atoms;

R^5 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, or cycloalkyl of 3 to 6 carbon atoms; and

R^6 is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

or a salt thereof of a pharmaceutically acceptable acid.

3,923,889

ALCOHOL-SOLUBLE ETHYL AURAMINE SALTS

Karl Schmeidl, Frankenthal; Manfred Eisert, Ludwigshafen, and Guenther Riefel, Heidelberg, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 8, 1973, Ser. No. 321,938

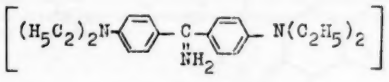
Claims priority, application Germany, Mar. 22, 1972, 2213848; Jan. 11, 1972, 2201162; Feb. 18, 1972, 2207609

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 R **1 Claim**

1. The dye of the formula:



(+) $SCN^{(-)}$

3,923,890

AMINOALKOXY-TETRAHYDRO-CYCLOPROPA [B]NAPHTHALENES

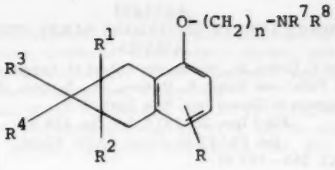
Venkatachala L. Narayanan, Hightstown, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 252,814, May 12, 1972, Pat. No. 3,796,760, which is a division of Ser. No. 73,668, Sept. 18, 1970, Pat. No. 3,694,512. This application Dec. 17, 1973, Ser. No. 425,413

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570.7 **2 Claims**

1. Compounds of the structure



wherein R is hydrogen, lower alkyl, lower alkoxy or cycloalkyl; R^1 and R^2 are the same or different and are hydrogen, lower alkyl or lower alkoxy; R^3 and R^4 are the same or different and are hydrogen, chlorine or bromine, at least one of R^3 and R^4 being other than hydrogen; R^7 and R^8 are the same or different and are hydrogen, lower alkyl, benzyl, monocyclic cycloalkyl, monocyclic aryl or hydroxy-lower alkyl; *n* is 2 to 6; and acid addition salts thereof, wherein lower alkyl and lower alkoxy refer to groups having up to 8 carbon atoms; wherein cycloalkyl refers to cycloalkyl groups having 3 to 6 carbon atoms; and wherein monocyclic aryl is phenyl, lower alkylphenyl, di-lower alkylphenyl, chlorophenyl, bromophenyl, nitrophenyl or 2,4,6-trichlorophenyl.

3,923,891

HYDROGENATION OF BENZONITRILE TO DIBENZYLAMINE

Harold Greenfield, Watertown, and Ronald S. Sekellick, Naugatuck, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jan. 18, 1973, Ser. No. 324,684

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.9 **6 Claims**

1. In a process for the hydrogenation of benzonitrile to dibenzylamine, the improvement of carrying out the reaction in the presence of a platinum catalyst and from 3 to 50 parts of water per 100 parts of benzonitrile.

3,923,892

AROMATIC AMINE ALKYLATION

Osakar E. H. Klopfer, Lamar, Ark., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 102,075, Dec. 28, 1970, abandoned, which is a division of Ser. No. 782,706, Dec. 10, 1968, Pat. No. 3,654,331. This application Mar. 25, 1974, Ser. No. 454,134

Int. Cl.² C07C *85/00*

U.S. Cl. 260—578 **13 Claims**

1. In a process for alkylating an aromatic amine selectively in a nuclear position ortho to the amine group, said aromatic amine having at least one hydrogen atom bonded to said amine group and having at least one nuclear position ortho to said amine group unsubstituted except for hydrogen, said process comprising reacting said aromatic amine with an olefin hydrocarbon at a temperature of about 200°–400°C in the presence of an aluminum anilide catalyst, the improvement of forming said aluminum anilide catalyst by adding an alkyl aluminum halide to said aromatic amine, said improvement resulting in an alkylation rate in excess of that obtained under the same conditions using a non-halogen aluminum anilide catalyst.

3,923,893

PRODUCTION OF SECONDARY ALKYL PRIMARY AMINES

Walter C. Gates, Jr., Newburgh; Robert M. Suggitt, Wappingers Falls, and Ralph B. Hudson, Jr., Beacon, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,639

Int. Cl.[2] C07C *85/11, 85/00, 87/04*

U.S. Cl. 260—583 M 10 Claims

1. In a process for producing secondary alkyl primary amines from n-paraffins having from 6 to 30 carbon atoms wherein a portion of said n-paraffin is nitrated to form a nitroparaffin along with nitrated and oxygenated by-products, wherein said nitroparaffin is essentially completely hydrogenated to said amine and where said amine is separated and recovered from a mixture of unreacted paraffin and by-products, the improvement which comprises:

a. catalytically hydrogenating said mixture of unreacted paraffin and by-products containing from about 10 to 5000 parts per million of nitrogen present as aminated by-products at a temperature of from about 650 to 710°F. under a hydrogen pressure of about 100 to 1500 p.s.i.g. in the presence of a catalyst composed of alumina and a Group VIII metal and

b. recycling said hydrogenated product of (a) for nitration with said n-paraffin.

3,923,894

PROCESS FOR SEPARATING ETHYLENE DIAMINE FROM CAUSTIC AND SODIUM CHLORIDE

Harry W. Andrewsen, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 16, 1972, Ser. No. 235,184

Int. Cl.[2] C07C *85/26*

U.S. Cl. 260—583 N 6 Claims

1. The process of: (1) separating sodium chloride, and (2) quantitatively separating ethylene diamine from a mixture comprising water, caustic, ethylene diamine and sodium chloride, which comprises:

a. evaporating ethylene diamine and water from said mixture at a temperature in the range of from about 150° to 300°F. and a pressure in the range of from about 1 to 12 psia, said evaporation of diamine being substantially quantitative until

i. the concentration of caustic in the remaining portion of said mixture is 40 to 75 weight percent based on the caustic and water content of said remaining portion, and

ii. a portion of said sodium chloride crystallizes in said remaining portion of said mixture; and

b. separating crystallized sodium chloride from said remaining portion.

3,923,895

PREPARATION OF CYCLOALKANONES AND CYCLOALKANOLS

Michel Costantini; Noel Crenne, both of Lyon; Michel Jouffret, Francheville-Le-Bas, and Jacques Nouvel, Lyon, all of France, assignors to Rhone-Poulenc S.A., Paris, France

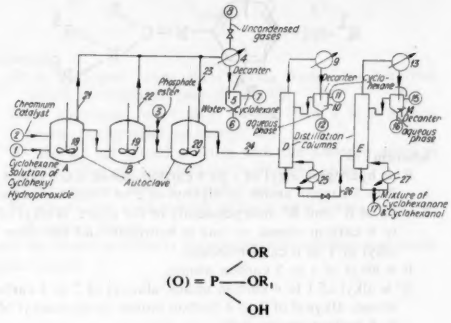
Filed May 14, 1971, Ser. No. 143,472

Claims priority, application France, May 15, 1970, 70.17837

Int. Cl.[2] C07C *49/30, 35/08*

U.S. Cl. 260—586 P 3 Claims

1. In a process for the continuous preparation of a mixture of cyclohexanone and cyclohexanol by oxidation of cyclohexane in the liquid phase by means of a gas containing molecular oxygen, followed by heating the resulting solution of cyclohexyl hydroperoxide in cyclohexane, at 80°–150° C. in the presence of a soluble chromium catalyst, the improvement which comprises carrying out at least a part of the heating of the hydroperoxide solution in the presence of a monoester of diester of orthophosphoric acid which is soluble in the reaction medium and which has the formula:



in which R represents a hydrocarbon selected from the group consisting of alkyl, cycloalkyl, aryl and aralkyl having up to 18 carbon atoms and R_1 represents a hydrogen atom or a hydrocarbon selected from the group consisting of alkyl, cycloalkyl, aryl and aralkyl having up to 18 carbon atoms, R and R_1 being the same or different, at least one of R and R_1 having more than three carbon atoms, and wherein the amount of orthophosphate ester used is such that it introduces 0.5 to 2.5 gram atoms of phosphorus per gram atom of chromium introduced in the form of a catalyst.

3,923,896

SUBSTITUTED-3-OXO-BUTANOYL-CYCLOHEXENES

Karl-Heinrich Schulte-Elte, Onex, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

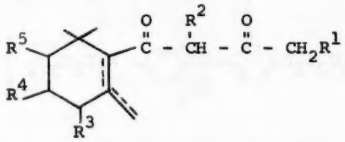
Filed Mar. 30, 1973, Ser. No. 346,296

Claims priority, application Switzerland, Mar. 30, 1972, 4770/72

Int. Cl.[2] C07C *49/61*

U.S. Cl. 260—586 R 4 Claims

1. Compounds of the formula



wherein the ring contains one double bond in position 1 or an exocyclic bond at position 2, R^1 and R^2 both represent hydrogen or one of them represents a lower alkyl containing from 1 to 6 carbon atoms and the other hydrogen, R^3, R^4 and R^5 all represent hydrogen or one of them represents a lower alkyl containing from 1 to 6 carbon atoms and the others hydrogen.

3,923,897

PRODUCTION OF HOPLIKE BEVERAGE BITTERING MATERIALS

Leonard R. Worden, Kalamazoo, Mich., assignor to Kalamazoo Spice Extraction Company, Kalamazoo, Mich.

Filed Apr. 2, 1973, Ser. No. 346,741

Int. Cl.[2] C07C *45/16, 45/00*

U.S. Cl. 260—586 D 15 Claims

1. The process for the oxidation of a 3',5'-dialkyl-2',4',6'-trihydroxyalkanoylphenone to a 6-alkanoyl-2,4-dialkyl-2-hydroxycyclohexane-1,3,5-trione, an alpha acid, said alkanoyl and alkyl groups containing a maximum of 8 carbon atoms, comprising the step of contacting an organic peracid oxidizing agent with the starting 3',5'-dialkyl-2',4',6'-trihydroxyalk-

anoylphenone in the liquid phase to produce said 6-alkanoyl-2,4-dialkyl-2-hydroxycyclohexane-1,3,5-trione.

7. A process of claim 1 which further includes the production of a 2,4-dialkanoyl-5-alkyl-4-hydroxycyclopentane-1,3-dione as iso-alpha acid, by carrying out said oxidation of said phenone with a peracid in the presence of a water-immiscible organic solvent, and isomerizing the said thus-formed trione, an alpha acid, into an iso-aipha acid without isolation of the trione by adding sufficient salt of a metal, selected from the group consisting of sodium, potassium, manganese, nickel, cerium, and Group IIA and Group IIB elements of the Periodic Table, to maintain the alpha acid in the water-immiscible organic solvent, the pH being maintained at 13 or below.

3,923,898

PROCESS FOR THE OXIDATION OF ALKYL-SUBSTITTUTED 2-CYCLOHEXEN-1-ONES

Karl-Heinrich Schulte-Elte, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

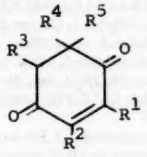
Filed Nov. 8, 1973, Ser. No. 414,083

Claims priority, application Switzerland, Nov. 16, 1972, 16737/72

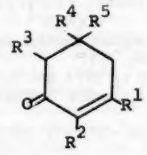
Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 P **3 Claims**

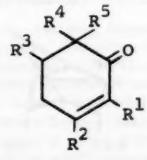
1. A process for the preparation of a diketone compound of the formula



wherein (a) one of the symbols R^1, R^2, and R^3 represents a lower alkyl radical and each of the two others represents a hydrogen atom, or (b) two of the symbols R^1, R^2 and R^3 represent each a lower alkyl radical and the other a hydrogen atom and wherein each of the symbols R^4 and R^5 represents a lower alkyl radical, which comprises contacting a ketone compound of the formula:



or



wherein R^1, R^2, R^3, R^4 and R^5 are the same as defined in Formula I above with at least three equivalents, per equivalent of ketone, of an oxidation agent selected from alkali metal chromate, alkali metal bichromate and chromium trioxide and a mixture of acetic acid and acetic anhydride to directly oxidize the ketone to the diketone; said contacting being carried out at a temperature of between about 5° and 50°C.

3,923,899

TRICYCLO(5,3,1,$0^{3,8}$)UNDECA-5,9-DIEN-2-ONES

Georg Frater, Greifensee; Hans Greuter, Horgen, and Hans Schmid, Schwerzenbach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

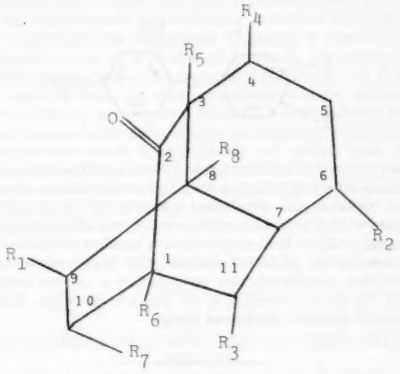
Division of Ser. No. 300,603, Oct. 25, 1972, Pat. No. 3,836,584. This application Apr. 12, 1974, Ser. No. 460,631

Claims priority, application Switzerland, Nov. 21, 1971, 16517/71

Int. Cl.² C07C *49/45*

U.S. Cl. 260—586 G **7 Claims**

1. A compound of the formula:



wherein R_1, R_7 and R_8 are independently selected from the group consisting of lower alkyl, hydrogen and lower alkoxy; R_2 is a hydrogen atom, lower alkyl or lower alkenyl; R_3 and R_4 are independently selected from the group consisting of hydrogen or lower alkyl; R_5 and R_6 are independently lower alkyl.

3,923,900

1-(6-METHOXY-2-NAPHTHYL)ETHYL HYDROXYMETHYLKETONE

Francis J. Petracek, Bloomington, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed May 3, 1972, Ser. No. 250,039

Int. Cl.² C07C *49/76, 49/82*

U.S. Cl. 260—590 **2 Claims**

1. The compound 1-(6-methoxy-2-naphthyl)ethyl hydroxymethylketone.

3,923,901

PARTIAL ALKYLATION OF POLYHYDROXYBENZOPHENONES

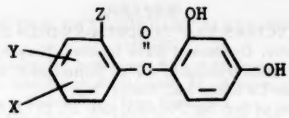
Dale Edward Battin, Parkersburg, W. Va., and Harold Godfred Thompson, Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 66,882, Aug. 25, 1970, abandoned. This application Aug. 31, 1973, Ser. No. 393,375

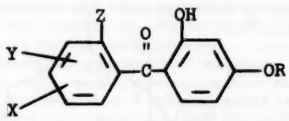
Int. Cl.² C07C *49/80, 49/84*

U.S. Cl. 260—591 **7 Claims**

1. In the process for alkylating a polyhydroxybenzophenone of the formula:



where Z is hydrogen, alkyl, alkoxy, halogen or hydroxy and where X and Y individually are hydrogen, alkyl, alkoxy or halogen to produce an ortho hydroxy, para alkoxybenzophenone of the formula



where R is alkyl and Z and X and Y are as defined above; said process involving refluxing the polyhydroxyphenone in a solvent containing an alkyl halide selected from the group consisting of alkyl chlorides, alkyl bromides and alkyl iodides and an acid acceptor for a time sufficient to effect alkylation, and recovering the alkylated product, the improvement which comprises conducting said alkylation in a solvent selected from the group consisting of the mono lower alkyl ethers of ethylene glycol or diethylene glycol.

3,923,902
ALIPHATIC COMPOUNDS CONTAINING OXYGEN ATOMS

Harold Crosbie Fielding, Northwich, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 699,049, Jan. 19, 1968, Pat. No. 3,632,641. This application Dec. 30, 1970, Ser. No. 102,918

Claims priority, application United Kingdom, Jan. 23, 1967, 3361/67

Int. Cl. C07c *49/04*

U.S. Cl. 260—593 H **3 Claims**

1. A process for making the perfluoroalkylmethyl trifluoromethyl ketone, $(C_2F_5)_2(CF_3)C.CH_2COCF_3$, comprising reacting at 25° to 100°C. tetrafluoroethylene pentamer which is internally unsaturated and branched chain and has the emperical formula $(C_2F_4)_5$ with an aqueous solution of an alkali metal hydroxide selected from sodium hydroxide and potassium hydroxide containing from 5 to 15% by weight of the alkali metal hydroxide.

3,923,903
OXIDATION OF CYCLIC MONO-OLEFINS TO α,ω-DIALDEYDES

Laszlo Imre, Cologne; Alfons Klein, Dusseldorf, and Karlfried Wedemeyer, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 28, 1973, Ser. No. 419,852

Claims priority, application Germany, Dec. 16, 1972, 2261657; June 9, 1973, 2329586

Int. Cl.² C07C *45/02*

U.S. Cl. 260—598 **9 Claims**

1. A process for the production of an alpha,omega-dialdehyde, comprising reacting a cyclic mono-olefin having about five 12 carbon atoms in the gaseous phase with about 0.005 to 200 times the molar amount of oxygen without a catalyst at a temperature of about 200° to 500°C and a pressure of about 0.05 to 100 atmospheres.

3,923,904
METHOD FOR PREPARING DIETHYLKETONE WITH GOOD SELECTIVITY

Hajime Hara, Fujisawa, Japan, assignor to Nippon Oil Company Ltd., Tokyo, Japan

Filed Apr. 23, 1973, Ser. No. 353,529

Claims priority, application Japan, Apr. 26, 1972, 47-41862

Int. Cl.² C07C *45/02*

U.S. Cl. 260—597 A **9 Claims**

1. A method for producing diethylketone with increased formation velocity for reacting ethylene with carbon monoxide at a temperature of 100° – 300°C., a pressure of 10 – 300 Kg/cm², and in a alcohol-water solvent system, said alcohol selected from the group consisting of lower saturated aliphatic monohydric alcohols and ethyleneglycol, in the presence of a combined catalyst system of a rhodium compound selected from the group consisting of rhodium oxide, rhodium halogenide, rhodium carbonyl, rhodium complexes having ligands selected from the group consisting of triphenyl phosphine, triphenyl arsine and mixtures thereof, and an organophosphorous compound having an infrared A_1 carbonyl stretching frequency of $Ni(CO)_3L$ (L represents the organophosphorous compound) in methylene chloride in accordance with the definition by Tolman in the range of from 2,066 cm^{-1} to 2,072 cm^{-1}, thereby inhibiting the formation of high boiling substances as by-products.

3,923,905
METHOD OF PREPARING 2,3,5,6-TETRACHLOROBENZENETHIOL

Christian T. Goralski, Midland; George A. Burk, Bay City, and R. Garth Pews, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 19, 1974, Ser. No. 480,659

Int. Cl.² C07C *149/34*

U.S. Cl. 260—609 D **5 Claims**

1. A process for preparing 2,3,5,6-tetrachlorobenzenethiol which comprises reacting an alkali metal sulfhydrate or sulfide with 2,3,5,6-tetrachloronitrobenzene in a mole ratio of from 1:1 to about 2:1 at a temperature of from about 0°C to about 150°C in an inert organic solvent in which both reactants are soluble at the temperature employed.

3,923,906
PROCESS FOR THE MANUFACTURE OF 3-ALOGENO-5-HYDROXY-TRICYCLO[2.2.1.0^{2,6}]HEPTANES

Roger K. Huff, Wokingham, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 11, 1973, Ser. No. 359,585

Claims priority, application Switzerland, July 3, 1972, 9921/72

Int. Cl.² C07C *35/22*

U.S. Cl. 260—617 F **2 Claims**

1. An improved process for the manufacture of 3-halogen-5-hydroxy-tricyclo[2.2.1.0^{2,6}]heptanes of the formula.

where Hal represents chlorine or bromine wherein bicyclo[2.2.1]hepta-2,5-diene is reacted with hypohalous acid or a reagent forming a hypohalous acid in an aqueous organic medium at 0° to 30°C temperature and the product is isolated by extraction and distillation wherein the improvement comprises

employing, based on bicyclo[2.2.1]hepta-2,5-diene, essentially an equimolar amount of N-chlorosuccinimide or N-bromosuccinimide as said reagent forming a hypohalous acid, and

carrying out the reaction in said aqueous organic medium consisting of a 50:50 by volume of mixture of water: dioxane or water: acetone.

3,923,907
PROCESS FOR THE PREPARATION OF METHYLATED PHENOLS

Takeshi Kotanigawa; Mitsuyoshi Yamamoto, and Katsuyoshi Shimokawa, all of Sapporo, Japan, assignors to Director-General, Agency of Industrial Science and Technology, Japan

Filed July 19, 1972, Ser. No. 273,049
Claims priority, application Japan, July 21, 1971, 46-54429
Int. Cl.² C07C *37/16*
U.S. Cl. 260—621 R **6 Claims**

1. A process for methylating a phenol in an ortho position which comprises reacting a phenol having at least one unsubstituted ortho position and a methanol in the vapor phase in the presence of a catalyst consisting essentially of a sintered mixture of ferric oxide, zinc oxide, and a small amount of manganese oxide up to about 1.0%, calculated in terms of manganese, by weight of said ferric and zinc oxides, said phenol being of the group consisting of phenol; o-, m-, or p-cresol; 2, 3-, 2, 4-, 2, 5-, 3, 4-, or 3, 5-xylenol; or a trimethylphenol having at least one unsubstituted ortho position, said ferric oxide and zinc oxide being present in proportions giving an approximate ratio of ferric iron to zinc on an atomic weight basis of 2:1 to 2:3.

3,923,908
PROCESS FOR THE PREPARATION OF HYDROQUINONE AND/OR RESORCINOL BY THE CLEAVAGE OF DIHYDROPEROXIDES

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai; Hideki Yanagihara, Toyonaka, and Kunihiko Tanaka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 31, 1973, Ser. No. 411,362
Claims priority, application Japan, Nov. 21, 1972, 47-117446
Int. Cl.² C07C *37/08*
U.S. Cl. 260—621 C **2 Claims**

1. In a process for cleaving diisopropylbenzene dihydroperoxides by contacting a cleavage feed solution of the dihydroperoxides referred to as DHPO containing as impurities isopropylphenyldimethylcarbinol referred to as MCA, (2-hydroxy-2-propyl) cumene hydroperoxide referred to as CHPO and di-(2-hydroxy-2-propyl)benzene referred to as DCA, with an acid catalyst to obtain resorcinol and/or hydroquinone, the improvement which comprises carrying out the cleavage reaction of the dihydroperoxides by controlling the content of the impurities in the said feed solution to keep the ratio of the number of 2-hydroxy-2-propyl groups to the number of molecules of the dihydroperoxides as expressed by the equation the ratio = moles of MCA + moles of CHPO + 2 × moles of DCA/moles of DHPO
to a value of not more than about 0.16.

3,923,909
OXIDATION OF DIETHYLBENZENES

Philippe Jean Andre Camerman, Wezembeek-Oppem, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Feb. 20, 1973, Ser. No. 334,084
Claims priority, application Belgium, Oct. 4, 1972, 122730
Int. Cl.² C07C *39/02*
U.S. Cl. 260—624 R **14 Claims**

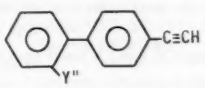
1. A process for producing ethylphenols which comprises (1) the oxidation of diethylbenzene by passing a molecular oxygen containing gas into contact with said diethylbenzene at a temperature between 125° and 160°C. to convert 5 to 30 percent of said diethylbenzene into diethylbenzene monohydroperoxide, (2) withdrawing the reaction mixture, separating the unconverted diethylbenzene therefrom to obtain a mono-hydroperoxide concentrate containing at least 40 percent of diethylbenzene mono-hydroperoxide, (3) mixing the diethylbenzene mono-hydroperoxide concentrate with a solvent selected from the group consisting of lower alkanols, lower alkanones and mixtures thereof, (4) decomposing said mono-hydroperoxide by intimately contacting said mixture of diethylbenzene mono-hydroperoxide and solvent with between 0.05 and 5 percent by weight of total reaction mixture of a strong acid, which does not interfere with the reaction, in concentrated form at a temperature between about 55° and 75°C., and neutralizing the resulting mixture, and (5) distilling the neutralized mixture to recover a bottom fraction containing ethylphenol and a top fraction containing acetaldehyde.

3,923,910
ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 268,419, July 3, 1972, Pat. No. 3,852,364. This application Jan. 7, 1974, Ser. No. 431,254
Int. Cl.² C07C *25/26*
U.S. Cl. 260—649 DP **4 Claims**

1. A compound of the formula



where:
Y'' is halo.

3,923,911
AR-VINYLBENZYL IODIDE

Suzanne V. McKinley, Wellesley, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 9, 1973, Ser. No. 377,480
Int. Cl.² C07C *25/14*
U.S. Cl. 260—651 R **2 Claims**

1. Meta- or para- ar-vinylbenzyl iodide.

3,923,912
METHYLENE CHLORIDE STABILIZED WITH KETONES

Norman L. Beckers, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 23, 1973, Ser. No. 334,985
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C07C *17/40*
U.S. Cl. 260—652.5 R **2 Claims**

1. A stabilized methylene chloride composition consisting essentially of methylene chloride and stabilizing amounts of from about 0.05 to about 2.0 percent by weight of the methy-

lene chloride of a compound selected from the group consisting of methyl ethyl ketone and acetone.

3,923,913

PROCESS FOR OBTAINING CHLORINATED DERIVATIVES OF ETHYLENE

Albert Antonini, Paris; Maurice Goharel, Saint-Auban; Claude Kaziz, La Courneuve, and Georges Wetroff, Le Thillay, all of France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Courbevoie, France

Continuation of Ser. No. 731,690, May 20, 1968, abandoned, which is a continuation of Ser. No. 453,818, May 6, 1965, abandoned. This application Aug. 2, 1973, Ser. No. 385,099

Claims priority, application France, May 12, 1964, 64.974079

Int. Cl.² C07C *21/00*

U.S. Cl. 260—654 H **6 Claims**

1. A continuous process for obtaining chlorinated ethylene derivatives wherein there are provided two successive reaction zones, one zone comprising a thermal zone for thermal chlorination and dehydrochlorination, and the other zone comprising an oxychlorination zone for catalytic oxychlorination, providing a regulating balance of C_2 compounds from one zone to the other, said process comprising the steps of introducing into said thermal zone three groups of reactants, the first of said groups consisting essentially of chlorine introduced at the rate of x moles/hour and ethane introduced at the rate of y moles/hour, the second of said groups consisting essentially of chloroethanes introduced at the rate of u moles/-hour as the regulating blanace from the oxychlorination to the thermal zone, and the third of said groups consisting essentially of a member selected from the group consisting of ethylene and at least one compound selected from the group consisting of vinyl chloride, vinylidene chloride, cis and trans dichloroethylenes, trichloroethylene and tetrachloroethylene introduced at the rate of v moles/hours, maintaining said thermal zone at a temperature between 400° to 650°C, the feeding of said groups of reactants being conducted whereby the ratio

$$\frac{u}{x+y}$$

is between 0.5 and 1.5, (v/u) is lower than 4, and

$$\frac{x}{y+v}$$

is lower than 3.5, maintaining the contact time in the thermal zone to provide a space velocity higher than 40 h^{-1} but not over 1200 h^{-1}, the effluent from said thermal zone comprising a mixture of hydrochloric acid, ethylene and at least one compound selected from the group consisting of vinyl chloride, vinylidene chloride, cis and trans dichloroethylenes, trichloroethylene and tetrachloroethylene, dividing the effluent from the thermal zone into two portions in which a first portion, forming 5 to 90 molar percent of the effluent, is introduced directly into the oxychlorination zone and a second portion comprising 10 to 95 molar percent of the effluent, treating the second portion for separation into one fraction free of hydrochloric acid and ethylene and thereby comprising the product of the process of one other fraction containing hydrochloric acid and ethylene, introducing said other fraction into the oxychlorination zone along with the first portion with the total hydrochloric acid introduced into the oxychlorination zone comprising 60 to 78 molar percent, based on the moles of compounds in the first portion and said other fraction and from which the hydrochloric acid is derived, and then introducing an oxygen containing gas into said oxychlorination zone with the oxygen representing 5 to 20 percent of the volume of said first portion and said other fraction taken in the vapor state, maintaining the reactants in said oxychlorination zone for a period of time between 1 and 25 seconds at a temperature ranging between 200° and 400°C, collecting at the outlet of the oxychlorination zone a mixture comprising an organic phase containing chloroethanes, and introducing said organic phase into said thermal zone to thereby adjust to u moles said second reactant group and to v moles of said third reactant group.

3,923,914

CHEMICAL PROCESS

Paul Kobetz, and Kenneth L. Lindsay, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed July 2, 1973, Ser. No. 375,871

Int. Cl.² C07C *17/20*

U.S. Cl. 260—658 R **10 Claims**

1. A catalyst free process for the production of dibromomethane and by-product alkali metal chloride comprising reacting, at a temperature within the range of from about 100° to about 175°C and in the presence of an inert solvent, alkali metal bromide and dihalomethane wherein at least one of the halogen constituents of the dihalomethane is chlorine and the remaining halogen is either chlorine or bromine, and the alkali metal constituent of the alkali metal bromide has an atomic number greater than 3 and wherein the dibromomethane and reactants are soluble in the solvent but in which solvent the alkali metal by-product is substantially insoluble and the solvent consists essentially of a mixture of monoalkyl ether of alkylene glycol and water in a volume ratio within the range of from about 1:1 to about 3:1 of the monoalkyl ether of alkylene glycol to water.

3,923,915

ISOMERIZATION OF SATURATED ALIPHATIC AND NAPHTHENIC HYDROCARBONS WITH A CATALYST CONTAINING A HYDROCARBYL-AROMATIC COMPOUND

Jean-Pierre Franck, Bougival; Bernard Torck, Boulogne-sur-Seine, and Jean-Francois Le Page, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 29, 1974, Ser. No. 501,698

Claims priority, application France, Aug. 30, 1973, 73.31480

Int. Cl.² C07C *3/56*

U.S. Cl. 260—666 P **10 Claims**

1. A process for the isomerization of a member selected from the group consisting of saturated aliphatic hydrocarbons, naphthenic hydrocarbons and mixtures thereof, said process comprising contacting said member at a temperature of 25°–400°C with a catalyst consisting essentially of an alumina carrier having incorporated therewith, at least one hydrogenating metal from Group VI-B, or compound thereof, and/or Group VIII, or compound thereof compound, at least one aluminum halide or hydrocarbylaluminum halide, and at least one hydrocarbylaromatic compound substituted by at least two substituents, said substituents being the same or different and selected from the group consisting of hydroxy, oxo and hydrocarbyloxy.

3,923,916

OXYDEHYDROGENATION OF ETHYL BENZENE

G. Edwin Vrieland, Midland, Mich., and Hans R. Friedli, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1974, Ser. No. 474,125

Int. Cl.² C07C *5/48*

U.S. Cl. 260—669 R **3 Claims**

1. A method of dehydrogenating ethyl benzene to form styrene comprising passing an oxygen containing gas and vapors of said ethyl benzene in a mole ratio of from about 0.5 to about 4 moles of oxygen per mole of ethyl benzene over a nickel pyrophosphate catalyst at a temperature of from about

450° to about 650°C. at a space velocity of from about 55 to about 2500.

3,923,917

PRODUCTION OF MONOVINYLACETYLENE

Alexander Ohorodnik, Erftstadt Liblar; Klaus Gehrmann, Erftstadt Lechenich; Günter Legutke, Bruhl, and Hermann Vierling, Hurth, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 10, 1974, Ser. No. 531,213

Claims priority, application Germany, Dec. 17, 1973, 2362602

Int. Cl.² C07C *11/22, 21/20*

U.S. Cl. 260—678 4 Claims

1. In a process for making monovinylacetylene, wherein acetylene is introduced at temperatures within the range 40° and 100°C and under acetylene gas pressures within the range 0.01 and 10 atmospheres (gauge) into a Nieuwland catalyst type solution being an aqueous copper(I) chloride solution in hydrochloric acid, which is used in admixture with between 0.1 and 10 weight% of an alkali metal salt of an aminocarboxylic acid or of an aminosulfonic acid and in further admixture with an organic monovinylacetylene solvent boiling at temperatures higher than about 150°C, immiscible with the solution and containing at least 40 weight% of indan together with further mononuclear aromates; wherein the catalyst solution and the solvent are mechanically dispersed by introducing acetylene thereinto with the resultant formation of a homogeneous catalyst liquid having between 25 and 85 % by volume of the solvent therein; wherein monovinylacetylene is continually stripped off from the dispersed solvent, which is saturated with monovinylacetylene, by introducing an excess of acetylene gas thereinto and wherein pure monovinylacetylene is recovered from the issuing gas mixture the improvement which comprises, concentrating the catalyst solution by evaporating water therefrom and dissolving additional copper(I) chloride in the catalyst solution so concentrated thereby establishing a molar ratio of Copper(I) Chloride to Alkali metal chloride or ammonium chloride complex former within the range 1.1 : 1.0 and 1.5 : 1.0 in the catalyst solution.

3,923,918

DIACETYLENE DIOL DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Takashi Nishida; Yoichi Ninagawa, both of Kurashiki; Yoshiaki Omura, Okayama; Fumio Mori; Yoshim Tamai, both of Kurashiki; Takeo Hosogai, Kiyonemura; Yoshiji Fujita, and Kazno Itori, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Japan

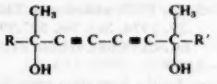
Filed Mar. 6, 1974, Ser. No. 448,700

Claims priority, application Japan, Mar. 19, 1973, 48-32274

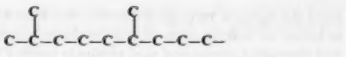
Int. Cl.² C07C *9/00, 5/02*

U.S. Cl. 260—676 13 Claims

1. A process for preparing squalane which comprises submitting a compound having the general formula:



wherein R and R'are the same or different and represent saturated or unsaturated hydrocarbon residues having 11 carbon atoms represented by the following carbon atom skeleton:



and may be substituted by a radical capable of being replaced by a hydrogen atom upon hydrogenolysis in the presence of an acidic substance.

3,923,919

ETHYLENE-PROPYLENE COPOLYMER OIL

Richard S. Stearns, Malvern; Irl N. Duling, West Chester, and David S. Gates, Swarthmore, all of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 269,625, July 7, 1972, Pat. No. 3,851,011, which is a continuation-in-part of Ser. Nos. 78,190, Oct. 5, 1970, Pat. No. 3,737,477, and Ser. No. 78,191, Oct. 5, 1970, Pat. No. 3,676,521, and Ser. No. 220,362, Jan. 24, 1972, which is a continuation-in-part of Ser. No. 78,190, , and Ser. No. 78,191, , said Ser. No. 78,190, and Ser. No. 78,191, each is a continuation-in-part of Ser. No. 621,443, March 8, 1967, abandoned. This application Mar. 19, 1974, Ser. No. 452,582. The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.

Int. Cl.² C07C *3/21, 3/26;* C10M *3/12*

U.S. Cl. 260—683.1 8 Claims

1. An ethylene-propylene copolymer oil having a KV_{210} in the range of 2–10 cs., a minimum ASTM D-2270 viscosity index of 110, a maximum pour point of 0°F., an ultraviolet absorptivity no greater than 0.2 at 197 millimicrons and which contains in the range of 40–71 mole percent ethylene as determined by infrared analysis, said oil having a maximum decrease in KV_{100} of 25% when subjected to the thermal stability test set forth in military specification MIL-H-27601A (USAF).

3,923,920

OLEFIN DISPROPORTIONATION CATALYST AND PROCESS FOR USING SAME

Robert B. Regier, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 129,201, March 29, 1971, Pat. No. 3,761,427. This application May 24, 1973, Ser. No. 363,481

Int. Cl. C07c *3/62*

U.S. Cl. 260—683 D 11 Claims

1. The process of disproportionating a disproportionatable feed material selected from the group consisting of disproportionatable cyclic and acyclic, branched and unbranched monoolefins and polyenes or mixtures of these monoolefins or polyenes with ethylene by contacting said material with a catalyst consisting essentially of about 0.1 to about 25 weight percent of tungsten oxide, molybdenum oxide, or mixtures thereof, about 0.01 to about 1.0 weight percent of fluorine, the remainder of said composition being substantially silica, the amount of fluorine being based on the weight of silica, and the amount of promoter material being based on the total weight of the composition.

3,923,921

NAPHTHA STEAM-CRACKING QUENCH PROCESS

Walter C. Kohfeldt, Madison, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 119,485, March 1, 1971, abandoned. This application May 30, 1973, Ser. No. 365,052

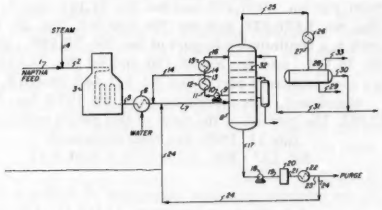
Int. Cl. C07c *3/30;* C10g *9/36*

U.S. Cl. 260—683 R 3 Claims

1. In a process of treating a hydrocarbon feed stock in a steam-cracking furnace at elevated temperatures and low hydrocarbon partial pressures to form unsaturated hydrocarbon products wherein a quenching medium is introduced into the effluent from the furnace and thereafter passing said effluent through a transfer line heat exchanger to the quench tower, the improvement which comprises passing said effluent

from the furnace through a transfer line heat exchanger zone to lower the temperature of said products below about 850°F. and thereafter contacting said products passing to the quenching and fractionation zone with:

a. from about 0.3 to about 0.8 parts by weight of a steam-cracked oil fraction recovered from the quench tower per one part by weight of the effluent from the furnace, said steam-cracked oil fraction having been withdrawn from the quench tower at a temperature in the range of from about 450° to about 550°F. and therafter passed through a heat exchanging zone in order to recover high level heat



in an amount in order to generate steam in the range of from about 100 to about 150 psig; and

b. from about 0.01 to about 0.03 parts by weight of a bottom fraction recovered from said quenching tower per one part by weight of the sum of the effluent and the steam-cracked oil fraction, said fraction boiling in the range of from about 500° to about 800°F. to lower the temperature of the products passing through the transfer line to the quench tower to a range of from about 525° to about 600°F. in order to maintain a liquid phase on the wall of said transfer line.

3,923,922

EPOXY-CROSSLINKED, FOAMED NITRILE CONTAINING POLYMERS AND METHOD OF PREPARING SAME

Thomas S. Grant, Vienna, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 301,386, Oct. 27, 1972, abandoned, which is a continuation of Ser. No. 104,520, Jan. 7, 1971, abandoned, and Ser. No. 301,387, Oct. 27, 1972, abandoned, which is a continuation of Ser. No. 104,521, Jan. 7, 1971, abandoned. This application Aug. 19, 1974, Ser. No. 498,784

Int. Cl.² C08J *9/00; C08L 63/00*

U.S. Cl. 260—2.5 EP **9 Claims**

4. A method of making a crosslinked, thermally processable and foamable thermoplastic composition comprising the steps of (1) melt mixing a blend comprising a thermoplastic copolymer selected from the group styrene-acrylonitrile copolymers, graft copolymers of styrene and acrylonitrile on rubbery diene substrates and mixtures thereof, an epoxy resin in the amount of from 0.1 to about 1.0% by weight of the said composition, and an acidic curing agent for the epoxy resin in the amount of from about 0.1 to about 1.0% by weight of the said composition at a temperature greater than 350°F. to thereby cure and crosslink said blend, (2) cooling and pelletizing said crosslinked blend, and (3) mixing said pelletized blend with a foaming agent in the amount of from 0.1 to 5% by weight of said composition.

3,923,923

TOUGHENED POLYSTYRENE

Lawrence D. Fiedler, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 11, 1974, Ser. No. 449,863

Int. Cl.² C08L *51/08, 83/10;* **C08F** *283/12*

U.S. Cl. 260—827 **3 Claims**

1. A method for the mass polymerization of styrene comprising

A. heating at a temperature from 80° to 150°C. a mixture of 70 to 99.75 weight percent styrene and 0.25 to 30 weight percent of a benzene soluble polydiorganosiloxane gum, said mixture being heated and agitated until from 10 to 40 weight percent of the styrene has polymerized producing a partially polymerized styrene mixture having particles dispersed therein containing the polydiorganosiloxane gum, said agitation being at a sufficient rate to provide an average particle size of from 0.5 to 10 microns,

B. continuing to heat the partially polymerized styrene mixture at a temperature higher than in step (A) until the styrene is substantially polymerized to polystyrene, during step (B) the agitation rate being reduced below the rate of step (A), thereafter

C. heating the product obtained from step (B) above 200°C. for at least 10 minutes and until the polymerized mass is substantially free of volatile ingredients but at temperatures and times insufficient to degrade the polystyrene, and thereafter a toughened polystyrene is obtained which consists essentially of a continuous polystyrene matrix having dispersed therein gelled particles consisting essentially of polystyrene grafted to a polydiorganosiloxane gum with inclusions of free polystyrene, having a range of diameters from 0.05 to 100 microns inclusive where the geometric mean diameter is from 0.5 to 10 microns, and which has values for room temperature notched Izod impact strengths in foot pounds per inch of notch wherein the notch is 45 degrees and 0.1 inch deep, of at least 0.40 for compression molded and unorientated samples,

said polydiorganosiloxane gum having a Williams plasticity greater than 0.020 inch and consisting essentially of from 50 to 99.9 mol percent dimethylsiloxane units, from 0 to 50 mol percent methylphenylsiloxane units, from 0 to 25 mol percent diphenylsiloxane units and from 0.1 to 30 mol percent methylvinylsiloxane units, said polydiorganosiloxane gum being endblocked with silicon-bonded hydroxyl radicals or triorganosiloxy units wherein the organic radicals are selected from methyl, phenyl and vinyl.

3,923,924

ANTISTATIC FIBER CONTAINING CHAIN-EXTENDED TETROLS BASED ON DIAMINES

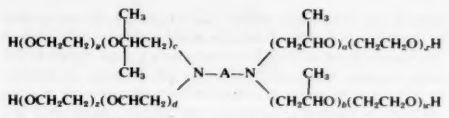
Rodney Lee Wells, and Lamberto Crescentini, both of Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 468,771, May 10, 1974, Pat. No. 3,876,725, which is a continuation-in-part of Ser. No. 341,194, March 14, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 527,995

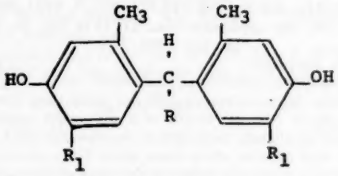
Int. Cl.² C08L *63/00, 77/00*

U.S. Cl. 260—830 P **10 Claims**

1. In a process for the formation of an antistatic polyamide fiber from a fiber-forming polyamide polymer containing about 1% to 12% by weight of an antistatic compound which is a chain-extended reaction product of a tetrol compound represented by the formula:



where *a*, *b*, *c*, *w*, *x*, *y* and *z* are each a whole number and A is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000, with an organic polyepoxy compound having two epoxy groups as the sole reactive groups under the conditions of the reaction, by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filaments, the improvements comprising dissolving in the extrudate prior to extrusion about 0.5 to 12% by weight, based on the weight of the antistatic compound, of a phenol compound of the formula:



where R is an alkyl hydrocarbon group containing less than nine carbon atoms and R_1 is a tertiary alkyl group containing at least four but not more than 12 carbon atoms.

3,923,925
PROCESS FOR THE PREPARATION OF POLYAMIDES WITH INCREASE IMPACT STRENGTH

Kurt Schneider; Friedrich Fahnier; Rolf Dhein, all of Krefeld, and Frieder Heydenreich, Lintorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation of Ser. No. 369,505, June 13, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,695

Claims priority, application Germany, Oct. 4, 1975, 2248664

Int. Cl.² C08G *69/18*

U.S. Cl. 260—857 PG **1 Claim**

1. A process for the production of polyamides with improved impact strength by activated anionic polymerization of a mixture comprising at least one lactam having at least 5 ring members, 0.1 to 1 mol %, based on the quantity of lactams of an activator selected from the group consisting of mono and polyisocyanates, and corresponding masked isocyanates, and an alkaline catalyst wherein said mixture is polymerized after the addition of 0.4–3% by weight of a high molecular weight polyalkylene glycol having unmodified end groups and a molecular weight of between 20,000 and 35,000 and an OH number below 6.

3,923,926
THIXOTROPIC POLYURETHANE COMPOSITION

Hideo Harada; Akinobu Ichihara, and Yasuro Ohmori, all of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jan. 29, 1974, Ser. No. 437,686

Int. Cl.² C08G *18/32*

U.S. Cl. 260—77.5 AP **11 Claims**

1. A thixotropic polyurethane composition comprising:

a. a liquid polyurethane prepolymer having at least two terminal free isocyanate groups and an average molecular weight within the range of 50 to 10,000, said polyurethane prepolymer being obtained by the addition polymerization of a polyisocyanate with an active hydrogen compound, and

b. a block polyether compound having both primary alcohol groups and secondary alcohol groups as terminal groups thereof, with the secondary alcohol number content being 40% to 85% with respect to the total number of terminal alcohol groups, said block polyether compound being a reaction product obtained by addition polymerization of ethylene oxide and propylene oxide in a block form to a starting material having two or three terminal active hydrogen groups in such a polymerization degree that said block polyester compound includes 30 to 409 moles of ethylene oxide and 3 to 172 moles of propylene oxide per molecule and the molar ratio is within the range of 1 : 0.05 to 1 : 0.5.

3,923,927
POLYESTER COMPOSITION CONTAINING SATURATED POLYESTER UNSATURATED TEREPHTHALATE POLYESTER AND VINYL MONOMER

Hideo Miyake, and Toshiaki Fuzimura, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1974, Ser. No. 444,069

Claims priority, application Japan, Feb. 23, 1973, 48-22522

Int. Cl.² C08L *67/00*

U.S. Cl. 260—861 **12 Claims**

1. An unsaturated polyester resin composition comprising

A. 70 to 97 parts by weight of at least one unsaturated polyester resin comprising

I. an unsaturated polyester comprising an α, β - unsaturated dicarboxylic acid component, a saturated dicarboxylic acid component in a ratio of 75/25 to 35/65 by mol, wherein the saturated dicarboxylic acid component contains 90 or more % by mol of terephthalic acid (on the basis of the saturated dicarboxylic acid component), and a glycol component, and

II. a vinyl monomer and/or allyl monomer which are copolymerizable with the unsaturated polyester, wherein the ratio of (I)/(II) is in a range of 80/20 to 30/70 parts by weight, and

B. 3 to 30 parts by weight of at least one saturated polyester comprising a saturated dicarboxylic acid component which contains 50 to 90% by mol of terephthalic acid (on the basis of the saturated dicarboxylic acid component) and a glycol component.

3,923,928
UNSATURATED POLYESTERS AND COMPOSITIONS BASED THEREON

Kenneth E. Atkins, South Charleston; Michael A. Harpold, St. Albans, and Percy L. Smith, Dunbar, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 31, 1973, Ser. No. 328,189

Int. Cl.² C08L *67/06*

U.S. Cl. 260—865 **13 Claims**

1. A composition comprising an unsaturated polyester which is the condensation product of a reaction mixture consisting essentially of ethylene glycol, diethylene glycol and an unsaturated dicarboxylic acid or anhydride thereof or mixtures of said acid and anhydride wherein the ethylene glycol is present in an amount of about 10 to about 90 percent by weight based on the combined weight of ethylene glycol and diethylene glycol, a polymerizable ethylenically unsaturated monomer in an amount of about 10 to about 60 percent by weight based on the combined weight of said monomer and said polyester, a Group II metal oxide or hydroxide thickener in an amount of about 0.5 to about 75 percent by weight based on the weight of said polyester.

3,923,929
COMPOSITION COMPRISING A DIALLYLIC PHTHALATE POLYMER AND A POLYPHENYLENE ETHER

Carl Leonard Wright, Pasadena, and Harry Hoyt Beacham, Severna Park, both of Md., assignors to FMC Corporation, Philadelphia, Pa.

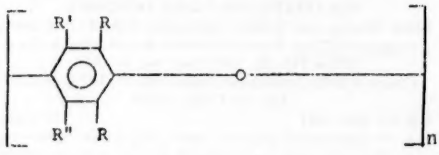
Division of Ser. No. 257,439, May 26, 1972, Pat. No. 3,826,786, which is a continuation-in-part of Ser. No. 101,004, Dec. 23, 1970, abandoned. This application Nov. 30, 1973, Ser. No. 420,514

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08F *29/12, 3/58, 29/50*

U.S. Cl. 260—874 **2 Claims**

1. A thermosetting resin composition comprising (a) 5 to 95 percent by weight of a diallylic phthalate prepolymer selected from the group consisting of diallyl orthophthalate prepolymers and diallyl isophthalate prepolymers, at least 5 of the 5 to 95 percent being a liquid monomer; (b) 5 to 95 percent by weight of a polyphenylene ether having a repeating structural unit of the formula



wherein the oxygen atom of one unit is connected to the benzene nucleus of the adjoining unit, *n* is a positive integer and is at least **10**, *R* is a monovalent substituent selected from the group consisting of hydrogen, hydrocarbon radicals free of tertiary α-carbon atom, halohydrocarbon radicals having at least two carbon atoms between the halogen atoms and the phenol nucleus and being free of a tertiary α-carbon atom, hydrocarbonoxy radicals being free of a tertiary α-carbon atom, and halohydrocarbonoxy carbon atoms having at least two carbon atoms between the halogen atom and phenol nucleus and being free of a tertiary α-carbon atom, R′ and R″ are both monovalent substituents which are the same as R and in addition, halogen, (c) a free radical catalyst in sufficient amount to convert the polymerizable material-polyphenylene ether mixture to the thermoset state at elevated temperatures, and (d) 0.1 to 1.5 percent anthracene, by weight based on the weight of the polymerizable materials as polymerization controller.

3,923,930
GRAFT POLYMERS AND LUBRICANT COMPOSITIONS THEREOF

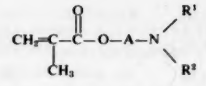
James O. Waldbillig, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 351,914, April 18, 1973, Pat. No. 3,879,304. This application Oct. 30, 1974, Ser. No. 519,381

Int. Cl.[2] C08L *47/00;* **C08F** *210/18, 255/06*

U.S. Cl. 260—878 R **3 Claims**

1. A graft polymer consisting of a linear terpolymer backbone component of between about 15 and 75 wt. % ethylene, between about 25 and 85 wt. % terminally unsaturated alkene of 3 to 10 carbons and between about 0.1 and 15 wt. %, terminally unsaturated non conjugated alkadiene of from 5 to 8 carbons having grafts thereon of a polymethacrylate composed of monomer selected from the group consisting of (1) a mixture of first alkyl methacrylate of 14 to 19 carbons and a second alkyl methacrylate of 20 to 24 carbons in a respective weight ratio of between about 10:1 and 1:10, (2) dialkylaminoalkyl methacrylate characterized by the formula:



where R^1 and R^2 are alkyl of from 1 to 2 carbons and A is alkadiyl of from 1 to 5 carbons, and (3) a mixture of (1) and (2), said backbone component to said graft component being present in a weight ratio in said graft polymer of between about 1000:1 and 1:10, said linear terpolymer backbone component having a carbon chain length of between about 700 and 7,000 carbons.

3,923,931
SYNTHETIC RESIN BINDER COMPOSITIONS COMPRISING A CROSS-LINKED ACRYLIC RESIN

Michael R. Fechillas, New Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. Nos. 311,036, Nov. 30, 1972, Pat. No. 3,836,514, and Ser. No. 195,373, Nov. 3, 1921, Pat. No. 3,732,139. This application Mar. 11, 1974, Ser. No. 450,278

Int. Cl.[2] C08L *31/02*

U.S. Cl. 260—885 **3 Claims**

1. A synthetic resin binder composition for bonding porous, absorbent, fibrous nonwoven fabrics comprising from about 10 to about 50% by weight of a polymodal synthetic N-methylol acrylamide cross-linked copolymeric alkyl ester of acrylic acid resin in which from about 10 to about 40% by weight has a molecular weight in the range of from about 300 to about 2000 and in which from about 90 to about 60% by weight has a molecular weight in the range of from about 4000 to about 600,000, said polymodal synthetic N-methylol acrylamide cross-linked copolymeric acrylic acid ester resin having a swell index in tetrahydrofuran of from about 50 to about 200 and containing from about 50 to about 90% by weight of insolubles in tetrahydrofuran.

3,923,932
3-HYDROXYMETHACRYLIC ACID METHYL ESTER DIMETHYL THIONOSPHOSPHATE

Ernest Beriger, Neuallschwil, and Ladislaus Pinter, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

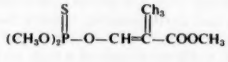
Continuation of Ser. No. 136,193, April 21, 1971, abandoned. This application Apr. 5, 1973, Ser. No. 348,426

Claims priority, application Switzerland, Apr. 21, 1970, 6028/70

Int. Cl.[2] A01N *9/36;* **C07F** *9/173*

U.S. Cl. 260—941 **1 Claim**

1. The compound of formula



3,923,933
PROCESS FOR PREPARING SINTERED URANIUM DIOXIDE GRAINS

Kenneth W. Lay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 172,291, Aug. 16, 1971, which is a continuation of Ser. No. 771,642, Oct. 29, 1968, abandoned. This application Oct. 9, 1973, Ser. No. 404,436

Int. Cl. G21c *21/00*

U.S. Cl. 264—.5 **9 Claims**

1. A process of preparing free-flowing substantially equiaxed uranium dioxide nuclear fuel grains of controlled size which comprises pressing powder consisting essentially of uranium dioxide or ammonium diuranate into compacts, sintering said compacts at a temperature of at least about 1900°C

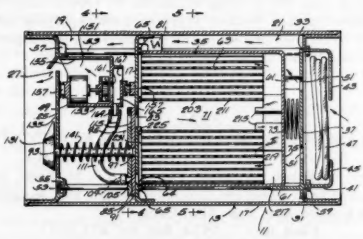
until grains of uranium dioxide of the desired size are formed therein, said sintering being carried out in an atmosphere of dry hydrogen having a dewpoint sufficient to produce substoichiometric uranium dioxide, and cooling said sintered compacts in an atmosphere of hydrogen at a rate of about 100 to 300 Centigrade degree per minute to precipitate metallic uranium substantially at the boundaries of the grains, and reacting said precipitated metallic uranium with hydrogen during said cooling at temperatures below about 400°C to form uranium hydride and thereby causing said sintered compacts to disintegrate substantially along the grain boundaries forming substantially equiaxial grains of uranium dioxide of substantially the same size.

7. A nuclear fuel comprised of sintered uranium dioxide having an oxygen to uranium ratio of about 2.00 and being in the form of whole, sinter-grown grains which are free-flowing and substantially equiaxed.

3,923,934
DISPENSING DEVICE

Lucius D. Watkins, Hartland, Wis., assignor to Permtek Incorporated, Hartland, Wis.

Continuation-in-part of Ser. No. 169,439, Aug. 5, 1971, Pat. No. 3,785,556. This application Nov. 2, 1973, Ser. No. 412,117
Int. Cl.² B01F *3/04*
U.S. Cl. 261—24 **17 Claims**



6. A device for controllably dispensing a liquid substance, said device comprising a housing including means defining an airtight chamber, a sealed envelope located in said chamber and containing the liquid substance to be dispensed, said envelope including wall means through which the liquid substance is permeable, outlet means communicating between said airtight chamber and the atmosphere, first valve means controlling air flow through said outlet means and operable between open and closed positions, inlet means communicating between the atmosphere and said airtight chamber, second valve means controlling air flow through said inlet means and operable between open and closed positions, motorized means for causing air flow through said chamber, and means for coordinated opening and closing of said first and second valve means and for controlling operation of said motorized means in coordination with the opening and closing of said valve means.

3,923,935
PARALLEL AIR PATH WET-DRY WATER COOLING TOWER

Robert E. Cates, Shawnee Mission, Kans., assignor to The Marley Company, Mission, Kans.

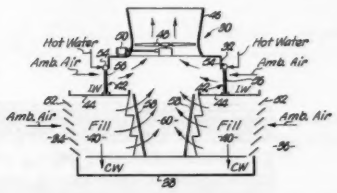
Filed Jan. 25, 1971, Ser. No. 109,489
Int. Cl.² B01F *3/04*
U.S. Cl. 261—159 **2 Claims**

1. In a water cooling tower, the combination of:

means for moving ambient air from the atmosphere along two separate, spaced paths of travel;

first heat exchange structure comprising a series of finned tubes adapted to receive hot water to be cooled and located in a pattern to bring such hot water into indirect heat exchange with an ambient derived airstream moving along one of said paths of travel thereof past the finned tubes to partially cool the water;

second heat exchange structure below said first heat exchange structure and including a horizontal water distribution basin located to receive partially cooled water from the finned tubes, and a fill assembly below said basin for receiving water therefrom to bring the partially cooled



water into direct, evaporative heat exchange relationship with an ambient derived airstream moving along the other of said paths of travel through the fill assembly to further cool the water,

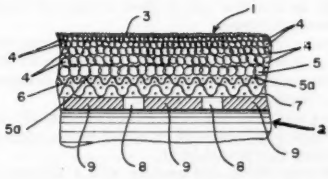
said finned tubes being arranged in disposition causing the lower ends thereof to be submerged in partially cooled water which collects in the water distribution basin; and

means for bringing the separate airstreams emerging from said first and second heat exchange structures into combined relationship before return thereof as a common stream to the ambient atmosphere.

3,923,936
METHOD OF FORMING AN OPEN-CELLED RESILIENT CAPILLARY DEVICE

William J. Davis, Wyomissing; Anthony J. Izbicki, Reading, and Johne Parsley, Kempton, all of Pa., assignors to MaTek Corporation, Reading, Pa.

Filed June 12, 1972, Ser. No. 262,085
Int. Cl.² B29D *27/04*
U.S. Cl. 264—25 **9 Claims**



1. A method for forming a resilient capillary device including the steps of:

foaming an aqueous suspension of a resilient polymer;

dissolving a sugar in the suspension;

casting the foamed suspension into a desired configuration;

heating the surface of the cast suspension rapidly to remove the water and rigidify the pores and cellular structure adjacent thereto more rapidly than the cells more remote from the surface;

continuing the heating of the cast suspension until it is dried and fully rigidified; and

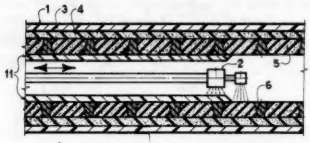
removing the sugar from the rigidified structure, whereby it is rendered resilient.

3,923,937

METHOD OF CENTRIFUGALLY CASTING PLURAL LAYERED CYLINDERS AND FORMING LONGITUDINALLY SPACED ANNULAR REINFORCEMENTS AND HELICAL REINFORCEMENTS THEREIN

Dino Piccioli, and Christian Schmid, both of Milan, Italy, assignors to Soffra Etablissement, Liechtenstein

Filed Aug. 29, 1973, Ser. No. 392,553
Claims priority, application Italy, Sept. 13, 1972, 29127/72
Int. Cl.[2] B29C 5/04; B32B 3/10, 3/26
U.S. Cl. 264—45.7 7 Claims



1. A process for obtaining a hollow cylindrical body having a support structure of reinforced thermosetting resin, using a mold having a horizontal axis and kept rotating at a speed which creates a centrifugal acceleration greater than the acceleration due to gravity, said process comprising the following stages:

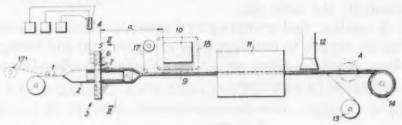
a. simultaneously feeding into said mold, and with progression in the axial direction of the mold a resin and a fibrous material and particulate fillers to form at least a first cylindrical wall coaxial with said mold and which will constitute the outer wall of a final hollow cylindrical body;
b. polymerizing said resin in the rotating mold;
c. feeding into said mold, and with progression in the axial direction of the mold, an expandable resinous material compatible with the resin of said first mold, and bonding same to said first wall to form a layer of substantially constant thickness;
d. forming, in said layer of substantially constant thickness, circumferential grooves through substantially the entire thickness of said layer, so as to expose portions of the inner surface of said first wall;
e. giving said grooves a cross section substantially of isosceles trapezium form with its major base emerging at the inner surface of said layer;
f. uniformly filling said grooves with a fibrous material, particulate fillers and a thermosetting resin compatible with the resins of said first wall and in said layer for improving its mechanical properties;
g. feeding into said mold, and progressively in the axial direction of said mold, a resin and simultaneously a fibrous material and particulate fillers to form at least a second cylindrical wall coaxial to said mold, bonded to said layer and bonded to said first wall by the resin, fibrous material and particulate fillers which fill said circumferential grooves, said second wall constituting an inner supporting wall of the final hollow cylindrical body, and, polymerizing said resin in said grooves, and the resin of said second wall in the rotating mold;
h. then halting said mold and extracting the hollow cylindrical body so obtained.

3,923,938

PROCESS FOR MANUFACTURING A PILE COVERING

Willy Poppe, Sint-Niklaas, Belgium, assignor to SERPO, naamloze vennootschap, Industriepark, Belgium

Filed Nov. 8, 1972, Ser. No. 304,719
Claims priority, application Belgium, Nov. 12, 1971, 51447; Nov. 3, 1972, 52296
Int. Cl.[2] B29D 27/00
U.S. Cl. 264—45.8 4 Claims



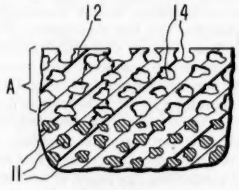
1. A process for manufacturing a pile covering which comprises shaping a support into a cylinder, applying to said cylindrically-shaped support from outside said cylindrical support and onto said cylindrical support along the full circumference of said support, a layer of a foam-forming polyurethane reaction mixture, converting said coated cylindrically shaped supporting layer into a flat surface, implanting pile fibers into the coated foamed layer before said layer has completely hardened, said fibers being implanted by electrostatic flocking, allowing said flocked layer to cure, applying suction thereto to remove any loose fibers therefrom, and separating said foamed fiber flocked layer from said support.

3,923,939

PROCESS FOR IMPROVING RELEASE KINETICS OF A MONOLITHIC DRUG DELIVERY DEVICE

Richard W. Baker, Mountain View; Alan S. Michaels, Atherton, and Felix Theeuwes, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed June 7, 1974, Ser. No. 477,297
Int. Cl.[2] B29D 27/00
U.S. Cl. 264—49 14 Claims



1. Method for substantially reducing the initial burst of active agent release from a monolithic active agent delivery device when said device is placed in its environment of use, said device comprising a shaped body of a dispersion of particulate active agent within a polymer matrix comprising prior to placing said shaped body in said environment, removing the particulate agent from the exterior surface of said body to form an agent depleted layer of polymer matrix voided by such removal of particulate active agent, the thickness of said layer being at least about 5% of the overall thickness of the body.

3,923,940
PROCESS FOR THE MANUFACTURE OF CERAMIC HONEYCOMB STRUCTURES

Tooru Hujii, Yokkaichi, and Eiichi Hisada, Nagoya, both of Japan, assignors to Nippon Toki Kabushiki Kaisha, Nagoya, Japan

Continuation-in-part of Ser. No. 234,914, March 15, 1972, abandoned. This application Mar. 28, 1973, Ser. No. 345,727
Claims priority, application Japan, Apr. 12, 1971, 46-22911
Int. Cl.[2] C04B *33/32*
U.S. Cl. 264—59 **12 Claims**

1. A process for the manufacture of a ceramic honey comb structure which comprises the steps of:

a. providing combustible rods or tubes of difficult to get wetted material selected from the group consisting of plastics, wood and paper,

b. applying water-absorbent paper to said combustible rods or tubes having a desired cross sectional shape,

c. coating said paper applied, combustible rods or tubes individually with at least one kind of a ceramics-forming material in slurry from having a water content from about 25% to about 60% by weight to form at least one layer thereof on the paper-applied rods or tubes,

(I) said ceramics-forming material consisting essentially of at least one member selected from the group consisting of aluminosilicate, alkaline earth metalsilicates, sillimanite, magnesium silicate, magnesia, zircon, zirconia, petalite, spodumene, cordierite, corundum, mullite, aluminum phosphate, spinel, carborundum and glass-ceramics;

d. said paper on said rods or tubes being effective to form a uniform coating of ceramic material on said paper-applied, combustible rods or tubes,

e. arranging at least two of the coated, paper-applied rods or tubes so that they contact with each other and together form a desired honeycomb structure blank;

f. drying the blank; and then

g. heating the dried blank to its sintering temperature in an oxidizing atmosphere to make it sintered and simultaneously burn away the base combustible rods or tubes and the base, water-absorbent paper thereby manufacturing the ceramic honeycomb structure.

3,923,941
PROCESS FOR PRODUCING A MARBLEIZED PLASTIC SHEET

John B. Weaver, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

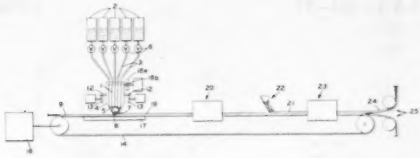
Division of Ser. No. 87,068, Nov. 5, 1970, abandoned. This application Oct. 10, 1972, Ser. No. 296,110
Int. Cl. B05c *5/02*
U.S. Cl. 264—73 **5 Claims**

1. A method for producing a marbleized plastic sheet having a controlled and substantially reproducible pattern extending through the thickness of the sheet which comprises:

1. forming a heterogeneous vari-colored plastisol mixture by feeding separate streams of plastisol having differing colors and/or transparencies to a receptacle having rotatable fluid-applicating means positioned in an opening in the bottom thereof, said opening in the bottom thereof being formed with a rim which is serrated to minimize contact of the fluid-applicating means therewith and to facilitate flow of the plastisol therefrom,

2. positioning said rotatable, ball-shaped, fluid-applicating means in contact with a substrate,

3. moving said substrate thereby causing rotation of said fluid-applicating means and feeding thereby of the plastisol mixture from said receptacle onto the surface of said moving substrate,



4. moving said fluid-applicating means in an irregular pattern while it is in contact with said moving substrate to form a marbleized pattern thereon,

5. gelling the marbleized coating,

6. Applying a clear plastisol coating onto the marbleized coating, and

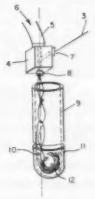
7. fusing the coatings to form a composite sheet consisting of the marbleized and clear plastisol coatings,

8. and finally, the step of stripping the composite sheet from the substrate.

3,923,942
FILLER MATERIAL AND METHOD OF MANUFACTURING SAME

Shiro Nishiumi; Shoichi Hasegawa, both of Otsu; Toshiyuki Mizoguchi, Takatsuki, and Sachiko Furuta, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 324,142, Jan. 16, 1973. This application Jan. 16, 1974, Ser. No. 434,907
Int. Cl.[2] D04H *1/62, 1/74*
U.S. Cl. 264—89 **9 Claims**



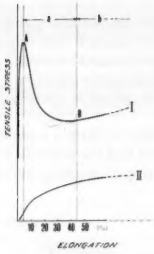
1. In a method of manufacturing a spherical body useful as a filler material, from a plurality of individual, discontinuous filaments which are at least 0.2 meters in length, the steps which comprise jetting a stream of said discontinuous filaments to open and separate said filaments, directing said filaments into a vessel having vent openings therethrough, causing said filaments to pile up therein, and then causing the piled filaments to bend three-dimensionally by subjecting them to entrainment in a rotating stream of gas which is directed eccentrically with respect to said vessel, said eccentric stream of gas also being directed to force said filaments to be condensed and rotated inside said vessel by centrifugal force into a generally spherical configuration with said filaments contacting each other and concentrated in the area of the surface of the sphere, and thereby transformed into a spherical body, and then adhering said filaments to each other at their contact points.

3,923,943

METHOD FOR MOLDING SYNTHETIC RESIN HOLLOW ARTICLES

Fumio Iriko, Tokyo; Yoshihiko Yuzawa, Yokohama; Setsuyuki Takeuchi, and Nobukuni Ibe, both of Sakaki, all of Japan, assignors to Nissei Plastics Industrial Co., Ltd. and Showa Denko Kabushiki Kaisha, both of Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,372
Claims priority, application Japan, Aug. 9, 1972, 47-79088
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—97 6 Claims



1. A molding method for producing a biaxially oriented hollow article from a parison made of a thermoplastic synthetic resin by blowing at a temperature below the melting point of said synthetic resin, which is characterized in mechanically stretching the parison in an axial direction and initiating blow-molding with a pressurized gas during the course of mechanical stretching and before the completion of the axial unidirectional orientation wherein the mechanical stretching is effected at a temperature below said melting point at which the synthetic resin exhibits a yield point and a yield limit, said blow molding is initiated when the parison has been stretched to a length between the yield point and yield limit, and wherein said blow-molding is effected at a higher temperature than the mechanical stretching, whereby an article of improved transparency is obtained.

3,923,944

BRIQUETTING CALCIUM CHLORIDE PARTICULATE

Michael J. Clark, Ludington, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 28, 1974, Ser. No. 437,267
Int. Cl. C01f *11/24*; B01j *2/22*; B01d *53/26*
U.S. Cl. 264—109 17 Claims

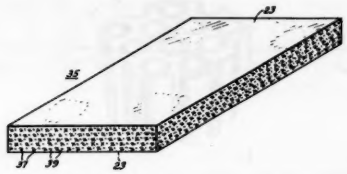
9. A method of producing a calcium chloride briquette from substantially anhydrous calcium chloride particulate by briquetting the particulate, the improvement comprising applying from about ½ to about 5 weight per cent water to substantially only the exterior surface of the briquette to thereby form a fracture resistant briquette which apart from a hydrated surface portion contains only substantially anhydrous calcium chloride.

3,923,945

METHOD OF MAKING CORROSION RESISTANT METAL FIBER REINFORCED PLASTIC COMPOSITES

Darral V. Humphries, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 254,328, May 17, 1972, abandoned, which is a division of Ser. No. 132,017, April 7, 1971, Pat. No. 3,687,798, which is a continuation-in-part of Ser. No. 853,071, Aug. 26, 1969, abandoned. This application Jan. 22, 1974, Ser. No. 435,560
Int. Cl.[2] B22F *9/00*
U.S. Cl. 264—111 10 Claims



1. A method of making corrosion resistant metal reinforced plastic composites comprising:

a. severing ferrous metal wires into discrete segments of ferrous metal fibers,

b. severing sacrificial metal wires having a greater electronegativity than iron into discrete segments of sacrificial metal fibers,

c. uniformly blending for a time in a blending apparatus predetermined proportions of the segmented ferrous metal fibers, the segmented sacrificial metal fibers and dry granules of a resin selected from the group consisting of thermoplastic and thermosetting resins together into a uniform mix of ferrous metal fibers, sacrificial metal fibers and resin in a ratio in a uniform dry mix such that upon subsequent fusion and solidification of the resin the relative percentages and distribution of the ferrous fibers and sacrificial metal fibers in the solidified resin are such that substantially no ferrous fiber is spaced from a sacrificial metal fiber along a cut surface of the solidified composite more than the distance effective to form a galvanic corrosion couple between substantially each ferrous fiber and the nearest sacrificial metal fiber and the ferrous fibers are in at least occasional electrical contact with the sacrificial metal fibers throughout the solidified resin,

d. directing said blend of ferrous metal fibers, sacrificial metal fibers and resin granules into a molding device,

e. heating and pressurizing the resin granules in said molding device to fuse and coalesce said resin into a plastic matrix throughout which said ferrous and sacrificial metal fibers are uniformly distributed in the relationship described in step (c) above, and

f. cooling said plastic matrix to cause solidification of said plastic matrix about said ferrous and sacrificial metal fibers to form a metal reinforced plastic composite.

3,923,946

COMPOSITE MATERIALS

Rene Meyer, Grenoble, France, assignor to Ugine Carbone, Grenoble, France

Filed May 20, 1974, Ser. No. 471,475
Claims priority, application France, May 17, 1973, 73.17847
Int. Cl.[2] B22F *3/00*
U.S. Cl. 264—111 6 Claims

1. A process for manufacturing a rigid composite material, comprising preparing an intimate mixture of particles of nonporous metal of high mechanical strength and high ductility and an organic thermosetting or thermoplastic resinous plastics material which has high mechanical strength and strong

adhesion to the metal particles in a proportion by volume corresponding to 5 to 20%, molding the resulting mixture in a closed mold under a pressure of at least twice the elastic limit of the metal, opening the mold, heating the compact thus obtained to a sufficiently high temperature to melt and, optionally, polymerize the plastic binder, followed by cooling.

3,923,947

PROCESS FOR CONTINUOUSLY PREPARING EXTRUDABLE, CROSSLINKABLE POLYETHYLENE COMPOSITIONS

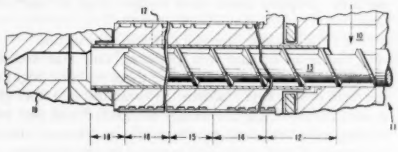
Homer Johnnie Cook, Seabrook, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 84,668, Oct. 28, 1970, abandoned. This application Feb. 5, 1973, Ser. No. 329,816

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B01J *2/20*

U.S. Cl. 264—141 **3 Claims**



1. In a continuous process for producing a crosslinkable polyethylene composition in the form of molding granules in which a polyethylene composition is continuously fed into the feed zone of a screw extruder, therein compacted, melted and passed through a metering zone to a discharge die, and in which a solution of a peroxy compound is injected into the molten polyethylene composition inside the extruder prior to extrusion of the molten polyethylene composition through the die, and in which the extrudate is cut into molding granules, the improvement which comprises:

a. selecting as the peroxy compound one which has a flash point of at least 70°C. and an equivalent half-life of more than 1 hour;

b. moderating the peroxy compound prior to injection by forming a moderated peroxy composition by dissolution or dispersion of the peroxy compound in an inert liquid carrier which is compatible with the polyethylene composition, said liquid carrier being selected from the group consisting of light oil and melted wax;

c. continuously injecting the moderated peroxy composition through injection ports into a mixing zone near the discharge end of the extruder at a rate sufficient to produce a concentration of from 0.1 to 5.0 percent by weight of said peroxy compound in the molten polyethylene composition in said mixing zone;

d. maintaining the temperature in said mixing zone at between 130° and 160°C.; and

e. operating the extruder screw at a rate such that the metering zone presses the molten polyethylene composition through the mixing zone and extrusion die at a rate such that the average hold-up time in the mixing zone is less than 12 minutes.

3,923,948

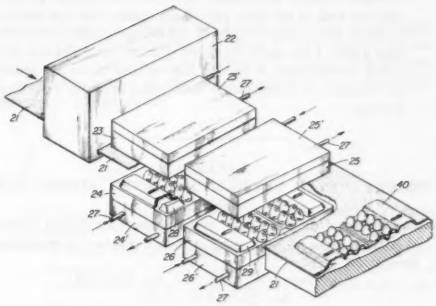
THERMOFORMING PLASTIC ARTICLES

William B. Jackson, Canandaigua, and Nicholas D. Commisso, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 182,334, Sept. 21, 1971, abandoned. This application Aug. 17, 1973, Ser. No. 389,398

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—161 **4 Claims**



1. A process for the production of a thermoformed thermoplastic article which comprises providing a relatively flat oriented sheet of polystyrene foam, preheating said sheet to at least its forming temperature, thermoforming said preheated sheet by impressing it against the surface of a first mold element removing said thermoformed article from said first mold element while said thermoformed article is still at an elevated and deformable temperature; directly impressing post mold cooling mold elements against at least portions of both sides of said thermoformed article thereby restraining at least said portions of said article against deformation and simultaneously cooling said portions below deformation temperature to avoid substantial distortion of said article upon removal from said post mold cooling mold elements.

3,923,949

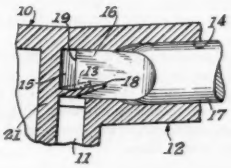
METHOD OF FORMING A SUCH-BACK-PREVENTING CHECK VALVE IN A LIQUID DISPENSER

Neil G. Kane, deceased, late of Hacienda Heights, Calif., and by Virginia L. Kane, administrator, 15411 Rojas St., Hacienda Heights, Calif. 91745

Division of Ser. No. 426,942, Dec. 20, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,846

Int. Cl.[2] B28B *7/28*

U.S. Cl. 264—163 **2 Claims**



1. The method of molding a check valve in the form of a flap to control liquid flow between a chamber in the manually telescopically movable head of a liquid dispenser that consists in the steps of:

molding said head of an elastomeric plastic to provide the same with concentric coaxial walls that define said chamber,

simultaneously molding a laterally directed spout around a core pin to form a flow passage within said spout, with

said spout extending from said coaxial chamber walls and the passage being open to the upper end of said chamber, the end of the core pin being formed to simultaneously mold a bridge portion of said elastomeric material, the bridge portion extending outwardly from the inner of said coaxial walls on an upward and forward angle, transversely across the passage, and integrally united with the side walls of the spout, and

finally withdrawing the core pin from the passage to cause vertical relative movement between the bridge portion and the end of the core pin which causes the end thereof to shear the opposite ends of the bridge portion from the side walls of the spout to convert said bridge portion into a flap so the same is free to flap up and down according to changes in pressure in said chamber and said flow passage.

3,923,950
PRODUCTION OF STABILIZED ACRYLIC FIBERS AND FILMS

Klaus Hannes Gump, Gillette, and Dagobert Englebert Stuetz, Westfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 200,184
Int. Cl.² C01B *31/02*
U.S. Cl. 264—182 **12 Claims**

1. An improved process for the production of stabilized acrylic fibers and films which are capable of undergoing carbonization comprising:

a. providing a solution of (1) an acrylic polymer selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers containing at least about 85 mol percent of acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith, (2) about 1 to 20 percent by weight based upon the weight of said acrylic polymer of an organic antioxidant having a melting point of at least 200°C. capable of moderating the oxidative cross-linking reaction of adjoining acrylic molecules selected from the group consisting of a nitrogen-free phenolic antioxidant, an aminophenol antioxidant, a non-phenolic aromatic amine antioxidant, a quinone antioxidant, a sulfur-containing antioxidant, and mixtures of the foregoing, and (3) a solvent for said acrylic polymer and said organic antioxidant selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, dimethyl sulfoxide, butyrolactone, and N-methyl-2-pyrrolidinone, with said solution prior to step (b) being heated for insufficient duration to accomplish a substantial degree of cyclization of pendant nitrile groups within said acrylic polymer while dissolved in said solvent,

b. forming from said solution by extrusion through a shaped orifice an acrylic fibrous material or film having incorporated therein about 1 to 10 percent by weight based upon the weight of said acrylic polymer of said organic antioxidant, and

c. heating said resulting acrylic fibrous material or film in an oxygen-containing atmosphere at a temperature of about 200° to 360°C. until a stabilized fibrous material or film is formed which retains its original configuration substantially intact and which is non-burning when subjected to an ordinary match flame.

3,923,951
METHOD OF MAKING A MOLDED FIBER GLASS AND RESIN STRUCTURE WITH INTERLOCKED AND BONDED WALLS

Peter Pukszta, Jr., 1001 E. Congress St., Sturgis, Mich. 49091

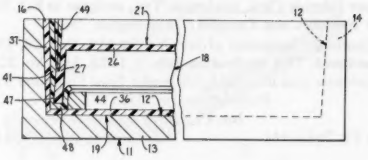
Filed Mar. 15, 1974, Ser. No. 451,524
Int. Cl.² B29D *3/02;* **B29G** *7/00*
U.S. Cl. 264—250 **8 Claims**

1. A method of molding a fiberglass reinforced structure having plural sidewalls interconnected by at least two spaced apart layers, comprising:

depositing a layer of curable fiberglass resin mixture over inside surfaces of a mold cavity and partially curing the resin of said mixture to form a first preform;

providing a preformed reinforcing member having a base with integral sidewalls connected to said base and forming an angled edge therewith, said sidewalls each having a further edge remote from said angled edge and also having an external recess adjacent said angled edge;

positioning a resin soaked fiberglass mat adjacent the sidewalls of said first preform;



disposing said reinforcing member within the mold with said sidewalls adjacent said mat and said base remote from the corresponding base of said first preform so as to cause a portion of said mat adjacent an edge thereof to be at least partially wrapped about said further edge of said sidewalls;

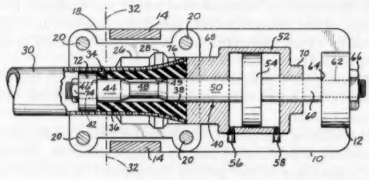
inserting resin soaked fiberglass in said recess; and

curing the resin of said first preform, said mat and said fiberglass in said recess to cause them to bond together, the resin of said first preform, said mat and said fiber glass in said recess being chemically integrated and said reinforcing member being mechanically interlocked thereto by reason of said recess and material inserted therein and the mat portion wrapped about said edge.

3,923,952
METHOD FOR SHAPING A NORMALLY RIGID PLASTIC PIPE

Harvey W. La Branche, Olympia, and John C. Dimmer, Tacoma, both of Wash., assignors to Western Plastics Corporation, Tacoma, Wash.

Filed May 23, 1973, Ser. No. 363,081
Int. Cl.² B29C *1/12*
U.S. Cl. 264—313 **8 Claims**



1. The method of shaping a normally rigid plastic tube comprising:

a. softening a selected zone of the tube adjacent a rigid zone,

b. surrounding the softened zone with a die,

c. inserting a resiliently deformable mandrel into the softened zone and the adjacent rigid zone,

d. pressing axially and simultaneously on the opposite sides of the mandrel sufficiently to expand the mandrel radially into frictional engagement with the softened zone and with the adjacent rigid zone and, while in such engagement to shorten the mandrel axially to radially expand the softened zone into forming contact with the die, thereby correspondingly expanding radially and shortening axially

said softened zone while proportionately thickening its side walls,

e. rigidifying said softened zone while in its dimension-altered condition, and

f. relaxing the mandrel and extracting it from the tube.

3,923,953
METHOD OF MOLDING POLYMERS

Harvey Scott, Blackwood, and Peter E. D. Morgan, Cherry Hill, both of N.J., assignors to The Franklin Institute Research Laboratories, Philadelphia, Pa.

Continuation of Ser. No. 855,754, Sept. 5, 1969, abandoned. This application June 23, 1972, Ser. No. 265,661

Int. Cl. C08g *20/32*

U.S. Cl. 264—325 **11 Claims**

1. A method for producing shaped articles composed of intractable polymer by the simultaneous molding and substantially solid state polymerization of monomeric material which comprises introducing into a molding zone, solid, finely particulate, solvent-free monomeric material capable of being polymerized to intractable polymer by heat with the evolution of gas and being selected from the group consisting of (a) single self-polymerizable monomers, (b) mixtures of different copolymerizable monomers, and (c) salt adducts composed of different polymerizable monomers, heating said monomeric material in the absence of solvent in said zone from a temperature below the melting point up to and through the polymerization temperature of said monomeric material while holding the non-gaseous contents of said molding zone under mechanical pressure and permitting escape of evolved gasses from said zone, the pressure and rate of heating being sufficient to densify said polymer but insufficient to cause exudation of solid and liquid material from said molding zone.

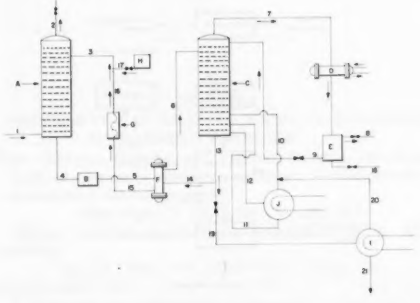
3,923,954
METHOD FOR, AND COMPOSITION USED IN, FLUID TREATMENT

Ernest Quentin Petrey, Jr., 44 Center Grove Road, Randolph Township, N.J. 07801, and Clinton Dale Breland, 2914 Peach Lane, Pasadena, Tex. 77502

Filed Dec. 4, 1970, Ser. No. 95,065

Int. Cl.[2] B01D *53/34*

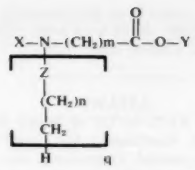
U.S. Cl. 423—210 **40 Claims**



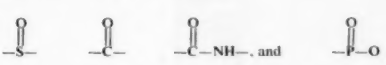
1. In a process for removing acid gases from an acid gas containing fluid by contacting the fluid with an acid gas absorption solution, the improvement comprising:

adding to the acid gas absorption solution a composition comprising:

a. at least one compound selected from the group consisting of N-paratoluenesulfonyl glycine, paraaminobenzoyl glycine and the alkali metal and ammonium salts thereof and a compound having the following structural formula:



wherein X is a member of the group consisting of hydrogen and an alkyl group containing from 1 to 6 carbon atoms, inclusive, Y is selected from the group consisting of hydrogen, an alkali metal, and an ammonium radical, Z is selected from the group consisting of:



m is an integer of from 1 to 6 inclusive, *n* is a number of from 0 to 6 inclusive and *q* is 1 or 0;

b. at least one ester which is selected from the group consisting of phosphoric and boric acid esters of a compound which contains at least one available hydroxyl group;

c. at least one water soluble chelating agent; and

d. at least one water soluble salt of metal selected from the group consisting of zinc, cadmium, copper, nickel and strontium;

said component (a) being present in an amount from about 50 to about 89.5 parts, component (b) in an amount from about 7.5 to about 30 parts, component (c) in an amount from about 2.5 to about 15 parts and component (d) in an amount from about 0.5 to about 5 parts, all by weight, based on 100 parts of the composition, said composition being added to the acid gas absorption solution to provide a corrosion inhibiting amount of said combination of components (a), (b), (c), and (d).

3,923,955
PROCESS FOR DEODORISING WASTE OR EXHAUST GASES

Volker Fattinger, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 29, 1974, Ser. No. 492,366

Claims priority, application Switzerland, Aug. 2, 1973, 11225/73; May 15, 1974, 6645/74

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—210 **22 Claims**

1. In a process for deodorising waste or exhaust gases in at least two washing stages with introduction of active chlorine, wherein a stream of the waste gas to be deodorised is subjected in an initial chlorine washing stage to the action of a washing liquid containing active chlorine, and in a subsequent chlorine washing operation to the action of a washing liquid, likewise containing active chlorine, of alkaline pH, the improvement comprising

a. the supplied active chlorine is practically free from chlorine dioxide;

b. a content of at least 0.02 g of active chlorine per liter of washing liquid is maintained in at least one of the washing stages;

c. the pH-value of the washing liquid in the first washing stage, through which the waste gas to be purified, is flowing, is kept to between 4 and 9, and

d. the pH-value of the washing liquid in the subsequent washing stage is kept between 7 and 11, with the pH-value in the said subsequent washing stage being adjusted to remain higher by 0.3 to 4 than the pH-value in the first stage;

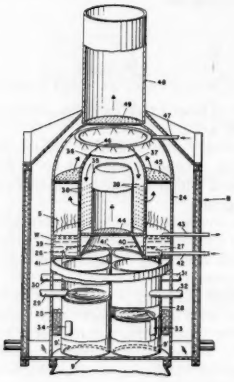
e. active alkali is added in an approximately stoichiometric amount, calculated on the total active chlorine supplied, in a subsequent washing stage.

3,923,956

SMOKELESS ANTI-TOXIC BURNER METHOD

Vernon D. Bowman, Washington, Md., assignor to Bowman Enterprises, Incorporated, Hagerstown, Md.

Filed Nov. 13, 1972, Ser. No. 305,885
Int. Cl.[2] B01D *47/00*
U.S. Cl. 423—210 **1 Claim**



1. The method of cleaning exhaust gases of minute solid particles comprising the steps of moving separate streams of the gases at high turbulence into and through a plurality of burning chambers, elevating the temperature of the streams of gases to not less than 1,400°F. in the burning chambers to burn any combustible and unburned material, collecting and mixing the combusted streams of gases into a single gas stream, forcing the single stream of the mixed gases upwardly at high velocity, reversing the direction of the gas stream and passing the combusted streams of gases into an expanding area and through a bath of moisture laden steam to cause said minute particles to be surrounded by the moisture carried by the steam to form a mixture, and thereafter cooling said mixture with a fine spray of water to condense the steam and form water droplets about the minute solid particles of a heavier mass than the steam-surrounded solid particles thereby removing the solid particles by gravity from the exhaust gas stream.

3,923,957

CONVERSION OF HYDROGEN CYANIDE IN FOUL GAS STREAMS TO CARBON DISULFIDE

Otto A. Homberg, Easton; Charles W. Sheldrake, and James B. Lynn, both of Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 3, 1973, Ser. No. 403,247
Int. Cl.[2] C01C *3/00*
U.S. Cl. 423—236 **19 Claims**

14. A low temperature method of removing hydrogen cyanide from a foul gas stream derived from a fuel gas desulfurization system comprising

a. providing sufficient oxygen and hydrogen sulfide in said gas stream to react in stoichimetric ratio with the amount of hydrogen cyanide which is to be removed from said gas stream in accordance with with the equation:

$$HCN + 2H_2S + \tfrac{1}{2}O_2 \quad CS_2 + NH_3 + H_2O \longrightarrow$$

b. contacting said gas stream with a surface active catalyst at a temperature of about 70°C to 500°C to convert the hydrogen cyanide content of the gas stream to carbon disulfide, ammonia and water in accordance with said equation.

3,923,958

METHOD OF REMOVING AROMATIC COMPOUNDS OLEFINS, ACETYLENES AND CARBON MONOXIDE FROM FEED STREAMS

Roy G. Turnbo, Deer Park, and Donald A. Keyworth, Houston, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 27, 1973, Ser. No. 345,316
Int. Cl.[2] B01D *53/34*; **C07C** *11/00*
U.S. Cl. 423—245 **10 Claims**

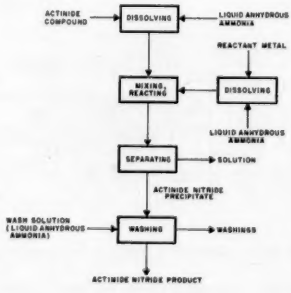
1. In a process for separating at least one complexible ligand selected from the group consisting of aromatic compounds, olefins, acetylenes, carbon monoxide, and mixtures thereof from a feed steam containing said ligand which comprises contacting the feed stream with a liquid sorbent having the formula $M_IM_{II}X_n$.Aromatic, wherein M_I represents a Group I-B metal, M_{II} represents a Group III-A metal, X represents halogen, n is the sum of the valences of M_I and M_{II}, and Aromatic represents a monocyclic aromatic compound having 6 to 12 carbon atoms, thereby forming a complex of the sorbent and the complexible ligand and separating said complexible ligand from said complex, the improvement that comprises incorporating in the liquid sorbent about 0.2 to 2 percent, based on the weight of the sorbent, of an antifoam agent that is a paraffinic hydrocarbon having from 5 to 25 carbon atoms.

3,923,959

METHOD FOR PREPARING ACTINIDE NITRIDES

Garry H. Bryan, Arvada; Jesse M. Cleveland, Boulder, and Clinton R. Heiple, Boulder, all of Colo., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 28, 1973, Ser. No. 419,833
Int. Cl.[2] C01G *56/00*, *43/00*; **C01F** *15/00*
U.S. Cl. 423—251 **12 Claims**



1. A method for forming actinide nitride precipitate selected from the group consisting of plutonium nitride, uranium nitride and thorium nitride, comprising providing a substantially dry, non-oxidizing and non-acidic atmosphere, dissolving an actinide compound wherein the actinide is selected from the group consisting of plutonium, uranium and thorium and a reactant metal in liquid anhydrous ammonia effecting a reaction and formation of said actinide nitride precipitate of a crystal size of between greater than zero and about 25 Angstroms.

3,923,960

COMPOSITIONS CONTAINING DITHIONITES

Roland Albert Leigh, 2 Lynwood Drive, Blakedown, Kidderminster, England

Filed Sept. 10, 1973, Ser. No. 395,544

Claims priority, application United Kingdom, Sept. 8, 1972, 41846/72

Int. Cl. B01d *17/66*

U.S. Cl. 423—265 **22 Claims**

1. A stabilised substantially anhydrous dithionite composition comprising a major proportion of a metallic dithionite and as a stabiliser a carboxylic acid salt of a primary, secondary or tertiary amine, which amine has at least one hydrocarbon group of at least 5 carbon atoms.

3,923,961

PRODUCTION OF PHOSPHORUS

William B. Dancy, Lakeland, Fla., assignor to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Oct. 5, 1970, Ser. No. 78,271

Int. Cl.² C01B *25/01, 25/02, 25/04, 15/16*

U.S. Cl. 423—323 **19 Claims**

1. Method for the production of elemental phosphorus and tricalcium orthophosphate by the thermal reduction of monocalcium phosphate comprising the steps of:

a. forming an intimate mixture of monocalcium phosphate and a carbonaceous reducing agent, the amount of carbon being sufficient to provide from about 20% to about 50% molar excess of that equivalent for reaction with the elemental phosphorus to be liberated in step (*c*);

b. rapidly heating the mixture prepared in step (*a*) to a temperature between about 2100° F. and about 2400° F. within a period of time not exceeding about 15 minutes to substantially avoid the formation of calcium metaphosphate and calcium pyrophosphate as intermediates;

c. continuing heating the mixture at said temperature range in a neutral or reducing atmosphere to convert the monocalcium phosphate to elemental phosphorus and tricalcium ortho-phosphate; and

d. recovering the elemental phosphorus and the tricalcium orthophosphate.

3,923,962

PROCESS FOR EFFECTING CHEMICAL REACTIONS UNDER PRESSURE

Kurt Schaupp, Cologne, and Manfred Schulze, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 27, 1972, Ser. No. 292,580

Claims priority, application Germany, Oct. 2, 1971, 2149313

Int. Cl. C01c *1/16*; **C01b** *33/12*; **C01g** *1/00*

U.S. Cl. 423—339 **3 Claims**

1. A process for continuously carrying out a chemical reaction in a U-shaped reaction zone under pressure but in the absence of externally applied pressure, said reaction requiring an increase in boiling point during reaction and involving at least one gaseous or readily volatile reactant, which comprises establishing a column of liquid in one of the legs of said U-shaped reaction zone, the height of said column of liquid establishing the pressure for said reaction, introducing the reactants into said column of liquid, at least one of the reactants being introduced into said column of liquid below its top, continuously adding liquid to said one leg, advancing it past the point of introduction of said one reactant along the connection with the other leg of said U-shaped reaction zone, and withdrawing liquid together with reaction product contained

therein from adjacent the top of the other leg of said U-shaped reaction zone.

3,923,963

METHOD FOR PURIFICATION OF HYDROGEN CHLORIDE

Walker H. Rideout, and Palmer S. Glenn, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 15, 1972, Ser. No. 315,397

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C01B *7/08*

U.S. Cl. 423—481 **9 Claims**

1. A method of purifying by-product hydrogen chloride obtained in the process of thermally cracking ethylene dichloride to form vinyl chloride, said by-product hydrogen chloride containing more than 50 ppm of organic impurities selected from the group consisting of ethylene, acetylene, vinyl chloride, ethyl chloride and vinylidene chloride; wherein the improvement comprises reducing by absorption and removal the said selected organic impurities in by-product hydrogen chloride to a level of less than 50 ppm by combining in a reaction zone (a) the impure by-product hydrogen chloride; (b) Cl_2, in at least a stoichiometric mole ratio to said organic impurities; and (c) activated carbon, at a temperature of at least 80°C., and a nominal residence time of at least 1 second.

3,923,964

PROCESS FOR THE PRODUCTION OF CALCIUM FLUORIDE FROM FLUOSILICATES AND BY-PRODUCT GYPSUM

Gustave E. Kidde, 294 California Terrace, Pasadena, Calif. 91105

Filed June 11, 1973, Ser. No. 368,670

Int. Cl.² C01F *11/22*

U.S. Cl. 423—490 **6 Claims**

1. A process for producing high quality calcium fluoride comprising:

a first reaction step wherein a fluoride containing fluosilicate solution is reacted with ammonia to an ending pH of at least about 8.8 to quantitatively precipitate silica from a fluoride solution;

separating the precipitated silica from the fluoride solution;

subjecting said fluoride, solution to a concurrent stripping and heating step whereby free ammonia is removed from the fluoride solution and ammonium fluoride is converted to ammonium bifluoride;

a second reaction step wherein $CaSO_4.2H_2O$ is reacted with the ammonium bifluoride to produce a high quality calcium fluoride product; and

recovering a calcium fluoride product containing at least about 97 percent calcium fluoride by weight.

3,923,965

PROCESS FOR ELIMINATING WASTE LIQUORS ACCUMULATED IN THE DESULFURIZATION OF COKE OVEN GAS

Peter Diemer; Gerhard Preusser, and Paul Radusch, all of Essen, Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 31, 1974, Ser. No. 519,563

Claims priority, application Germany, Dec. 13, 1973, 2361910

Int. Cl.² C01B *17/02*

U.S. Cl. 423—567 **5 Claims**

1. A process for the elimination of waste liquors accumulated in the desulfurization of coke oven gas with a washing solution containing an organic oxygen carrier comprising,

evaporating between about 30 and 70% of water from the waste liquor to form a concentrated waste liquor,

introducing said concentrated waste liquor into a combustion chamber,

introducing air into said combustion chamber,

introducing a sufficient amount of coke oven gas to provide a reducing atmosphere in said combustion chamber,

thermally decomposing said concentrated waste liquor in said combustion chamber and forming a lean gas and sulfur,

separating the sulfur from the lean gas,

admixing the lean gas with coke oven gas evolved during a coking process.

3,923,966

DIRECT MANUFACTURE OF HYDROGEN PEROXIDE FROM HYDROGEN SULFIDE

Lawrence G. Vaughan, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 21, 1973, Ser. No. 417,805

Int. Cl.² C01B *17/02, 15/02*

U.S. Cl. 423—573 **10 Claims**

1. In a method for preparing hydrogen peroxide by reducing and oxidizing an alkyl anthraquinone, or a tetrahydroalkyl anthraquinone, the improvement which comprises reducing said anthraquinone with hydrogen sulfide in an organic solvent solution in the presence of a concentration of from 0.5 to 35 percent by weight of the working solution of an organic base catalyst soluble in the organic solvent which does not decompose hydrogen peroxide, separating the elemental sulfur thus formed, oxidizing the resulting anthrahydroquinone and extracting the hydrogen peroxide with water.

3,923,967

PRODUCTION OF HYDROGEN PEROXIDE USING THE ANTHRAQUINONE PROCESS

Jack R. Kirchner, and Lawrence G. Vaughan, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

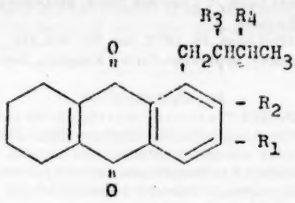
Continuation of Ser. No. 79,643, Oct. 9, 1970, abandoned. This application Jan. 12, 1973, Ser. No. 323,127

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C01B *15/02*

U.S. Cl. 423—588 **4 Claims**

1. In a cyclic process for producing hydrogen peroxide in which a working solution of an anthraquinone working intermediate in a water-immiscible solvent is hydrogenated in a reduction stage and the resulting solution of the anthrahydroquinone form of said intermediate is oxidized in an oxidation stage to regenerate said solution of the anthraquinone working intermediate for recycling to said reduction stage after the hydrogen peroxide simultaneously formed in said oxidation stage is removed from said working solution, the improvement comprising employing as said anthraquinone working intermediate a 5,6,7,8-tetrahydro-1-alkyl-9,10-anthraquinone of the formula



in which each of R_1, R_2, R_3 and R_4 is hydrogen or a 1 to 8 carbon straight chain alkyl hydrocarbon group.

3,923,968

METHOD OF PREPARING TITANIUM DIOXIDE PIGMENT

Max G. Basque, Pittsburgh; James E. Magner, Antioch; Joseph P. Surls, Walnut Creek, and Ben F. West, Orinda, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 189,827, Oct. 18, 1971, Pat. No. 3,749,764. This application Mar. 1, 1973, Ser. No. 336,978

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C01G *23/04*

U.S. Cl. 423—611 **5 Claims**

1. A process for the preparation of composite titanium dioxide pigment particles, each consisting of one or more elongate rutile monocrystals having lengths within the range of from 0.15 to 15 microns, diameters within the range of 0.01 to 0.1 microns and aspect ratios of from 5 to 200, surrounded by similarly elongated rutile crystallites having lengths within the range of 0.005 to 0.05 microns, diameters within the range of 0.01 to 0.1 microns and aspect ratios of from 5 to 50 and from 1 to 10 volume percent of interstitial non-rutile titanium dioxide, which comprises:

contacting said rutile monocrystals for at least 3 minutes with an acidic aqueous titanium chloride solution under at least autogenous pressure and at a temperature of from 80° to 150°C., thereby causing cross-sectional particle growth by deposition on said monocrystals of titanium dioxide hydrolysate in the form of said crystallities disposed with said interstitial titanium dioxide around said monocrystals in a configuration generally parallel thereto and continuing said contact until a growth ratio of up to about 18 has been achieved;

said solution containing from 0.1 to 60 grams of dissolved titanium per liter, from 0.004 to 9 gram ions of chloride per liter, not more than 0.001 gram ions of phosphate per liter and not more than 0.01 gram ions of sulphate and/or bisulphate per liter; and

the weight of titanium present in said monocrystals being from 1 to 50 percentof the weight of dissolved titanium in said solution

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3,923,969

CARRIER SYSTEM FOR A DRUG WITH SUSTAINED RELEASE

Werner Baukal, Kronberg, Taunus; Heinz-Joachim Kinkel, Schwalbach, Taunus; Erich Robens, Friedrichsdorf, and Gerhard Walter, Steinbach, all of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Germany

Filed June 12, 1973, Ser. No. 369,404

Int. Cl.² A61K *27/12*

U.S. Cl. 424—19 **1 Claim**

1. A carrier system for a drug which allows the sustained and prolonged release of the drug which consists of

i. a porous carrier aluminium oxide material which is insoluble or only slightly soluble in the body which is in dried jelly lump form which disintegrates into small particles

and which contains inkwell pore cavities which are connected to the outer surface by narrow pore necks, the mean diameters of the inkwell pore cavities in section being over twice as large as the mean internal widths of the necks of the inkwell pores, and the internal width of the necks of the inkwell pores being preponderantly less than 0.1 μm and

ii. a drug or pharmaceutically active substance which is embedded or contained only in said inkwell pore cavities, and which jelly has been formed by stirring together dropwise a mixture of aluminum isoproponate dissolved in benzene and a mixture of water and isopropanol, both mixtures containing the drug almost to the point of saturation, and drying the jelly which formed, to a lump which disintegrates into small particles.

3,923,970
STABLE AEROSOL SHAVING FOAMS CONTAINING MINERAL OIL

Hans Breuer, Somerville, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,236
Int. Cl.² A61K *7/06, 7/15*
U.S. Cl. 424—47 **9 Claims**

1. An aqueous soap emulsion suitable for aerosolization comprising about 4 to about 16% by weight of a water-soluble soap selected from the group consisting of sodium, potassium, ammonium, an alkylolamine soap of a fatty acid and mixtures thereof, from 3 to 6% by weight of an emulsifier selected from the group consisting of a sorbitan ester of a fatty acid and a polyoxyethylene oleyl ether having an HLB of 1–9 and from 5 to about 25% by weight mineral oil.

5. An aerosol shave cream package comprising a valve-controlled pressure-tight container containing from 1 to 15% of a liquefied propellant gas and the balance being the soap emulsion of claim **1.**

3,923,971
ANTIPERSPIRANT AND DEODORANT COMPOSITION CONTAINING LAMELLAR SUBSTANCES

Alexandre Seilinger, 8, Rue des Beaux Arts, Paris, France

Filed Sept. 13, 1973, Ser. No. 396,771
Int. Cl.² A61K *7/32*
U.S. Cl. 424—65 **5 Claims**

1. An antiperspirant and deodorant composition which consists of a glycerine paste composed of glycerine, water and gum tragacanth and an active ingredient constituted by natural or synthetic mica particles combined with said paste in an amount of about 30 percent, said mica particles being finely pulverized and having a lamellar structure with peripheral ridges of different granular size.

3,923,972
METHOD OF LOWERING BLOOD CHOLESTEROL LEVEL

Joseph E. Fields, Ballwin, and John H. Johnson, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 188,577, Oct. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 789,081, Jan. 2, 1969, abandoned. This application Apr. 23, 1973, Ser. No. 353,832
Int. Cl.² A61K *27/00*
U.S. Cl. 424—78 **9 Claims**

1. A method for lowering the blood cholesterol level in a living animal in need thereof comprising orally administering to said animal an effective blood cholesterol lowering amount of a copolymer of (1) an alpha alkene of about 8 to about 22 carbon atoms and (2) maleic acid or anhydride, or a pharmaceutically acceptable amide, ester, imide, salt thereof or mixtures thereof, said copolymer having a molecular weight in the range of from about 1000 to 1,000,000.

3,923,973
FUNGICIDAL POLYMERIC QUATERNARY AMMONIUM COMPOUNDS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 425,931, Dec. 18, 1973, Pat. No. 3,874,870. This application Sept. 30, 1974, Ser. No. 510,617. The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.
Int. Cl.² A61K *31/74;* **A01N** *9/20, 9/24*
U.S. Cl. 424—78 **5 Claims**

1. A method of controlling the proliferation of fungi in an aqueous system, which comprises applying to said fungi a fungicidally effective amount of a condensation product formed by mixing 1,4-bis-dimethylamino-2-butene dissolved in a solvent with 1,4-dihalo-2-butene at room temperature whereby an exothermic reaction is obtained causing the temperature of the mixture to rise, then maintaining the mixture at no higher than reflux temperature until the reaction is complete, wherein these reactants are present in a molar proportion of between about 1:3 and about 3:1 relative to each other.

3,923,974
SOLID FINE CRYSTALLINE PARACETAMOL POLYMER COMPLEX COMPOSITION

Roderic Stafford Andrews; Christoper George Barlow, and John Lewis Livingstone, all of Newcastle-upon-Tyne, England, assignors to Sterling Drug Inc., New York, N.Y.

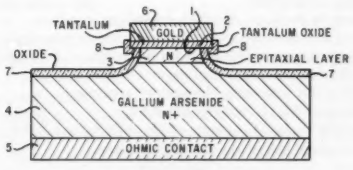
Division of Ser. No. 353,631, April 23, 1973, Pat. No. 3,851,032. This application Apr. 29, 1974, Ser. No. 465,159
Int. Cl.² A61K *31/79*
U.S. Cl. 424—80 **4 Claims**

1. A composition which is suitable for direct tablet compression and which comprises a solid fine crystalline paracetamol polymer complex, said polymer selected from homopolymers and copolymers of vinyl acetate and vinyl pyrrolidone, the polymer being present in an amount of from 1 to 15%, by weight on the weight of the paracetamol, and being distributed throughout each crystal associated as said complex.

3,923,975
TANTALUM-GALLIUM ARSENIDE SCHOTTKY BARRIER SEMICONDUCTOR DEVICE

Joseph A. Calviello, Kings Park, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Division of Ser. No. 404,303, Oct. 9, 1973, Pat. No. 3,886,580. This application Jan. 23, 1975, Ser. No. 543,633
Int. Cl.² H01C *7/00;* **H01G** *9/00*
U.S. Cl. 427—84 **3 Claims**



1. A method of fabricating a Schottky barrier electrode structure on a body of gallium arsenide, comprising the steps of

a. cleaning the surface of said body,

b. depositing a film of tantalum on a region of said surface by evaporation in vacuum in the absence of water, while maintaining the pressure below about 10^{-5} mm Hg, to a film thickness of about 2000A.

c. depositing a gold film upon said tantalum film,
d. etching the exposed surface of said gallium arsenide body to define the periphery of the Schottky barrier, and
e. oxidizing the exposed surfaces of said gallium arsenide body and said tantalum film.

3,923,976

PROCESS FOR RECOVERY OF ZINC FROM SOLUTIONS THAT CONTAIN IT AS A RESULT OF EXTRACTION WITH SOLVENTS FOR THEIR ADAPTATION TO ELECTROLYSIS

Jose Manuel Regife Vega, San Ernesto 12, and Eduardo Diaz Nogueira, Av. Mediterraneo 47, both of Madrid, Spain

Filed May 31, 1973, Ser. No. 365,718
Claims priority, application Spain, Aug. 10, 1972, 405759; June 3, 1972, 403506
Int. Cl.² C01G 9/06; C25C 1/16
U.S. Cl. 423—99 **11 Claims**

1. Process for preparation of zinc for electrolytic deposition from solutions containing zinc and chloride ions by a two-cycle extraction, the first cycle of which includes;

adjusting the chloride solution to at least 1.3M; extracting zinc from said solution by means of an organic solution including at least one member of a class of extracting agents selected from an amine or a quaternary ammonium compound of minimal solubility in water, said agents used in combination with a compatible organic diluent to serve as a carrier and viscosity reducer for said extracting agent; and

re-extracting with an aqueous solution to obtain a zinc enriched solution;

and a second cycle including;

extracting the zinc enriched aqueous solution of the first cycle from which more reactive metal cations have been removed, with a high molecular weight organic acid in admixture with a diluent carrier said diluent present to reduce viscosity;

re-extracting with an aqueous solution containing sulphate ions to prepare an electrolytic solution for zinc deposition.

3,923,977

ANTIBIOTIC FR-1923 SUBSTANCE

Hatsuo Aoki; Junji Hosoda, both of Ikeda; Tadaaki Komori, Takatsuki; Manabu Izeki; Yoshiaki Kubochi, both of Takarazuka; Takashi Kamiya, Suita, and Hiroshi Imanaka, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 284,634, Aug. 29, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,211
Int. Cl.² A61K 35/00
U.S. Cl. 424—118 **8 Claims**

1. An antibiotic substance, FR-1923, effective in inhibiting the growth of bacteria, said FR-1923 substance:

a. being amphoteric;
b. being in the form of white crystalline needles;
c. being very soluble in alkaline solution or dimethylsulfoxide, sparingly soluble in water or methanol, and insoluble in chloroform, ethyl acetate or ethyl ether;
d. having the following elementary analysis:
carbon = 54.31, hydrogen = 4.90
nitrogen = 10.71, oxygen = (by difference) 30.08:
e. having the following molecular formula:

$$C_{23}H_{24}N_4O_9$$

f. gradually changing on heating to brown at 187°C. and decomposing at 214–216°C;
g. having an ultra-violet absorption spectrum, when measured in 0.5 M phosphate buffer (pH 8.0), with a shoulder at 220 mμ and a maximum at 272 mμ ($E_{1cm}^{1\%} = 310$) as shown in FIG. 1;
h. having an infra-red absorption spectrum, when suspended in a Nujol mull, giving the following frequency (cm^{-1}) as shown in FIG. 2:
3450, 3250, 3200, 2700-2550, 1725, 1655, 1605, 1590, 1560, 1510, 1395, 1260, 1240, 1220, 1175, 1045, 930, 840, 810, 720; and
i. showing the following color reactions: positive in ninhydrin, Dragendorff's and ferric chloride-potassium ferricyanide tests, and negative in Ehrlich's, Molisch's, Fehling and Tollen's tests.

3,923,978

GATAVALIN AND PROCESS FOR PRODUCING SAME

Nobuhiro Nakajima, Fujimi; Shiro Nakatsugawa, Tokyo; Yasuo Koyama, Tokyo, and Shiro Chihara, Tokyo, all of Japan, assignors to Kayaku Antibiotic Research Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1972, Ser. No. 298,377
Int. Cl.² A61K 35/00
U.S. Cl. 424—118 **2 Claims**

1. Gatavalin having the following characteristic properties:
Molecular weight: about 2,000
Melting point: 245°~248°C.
Elementary analysis: C 51.19 percent, H 8.19 percent, N 14.16 percent Amino acids composition: glutamic acid (1 mol), aspartic acid (1 mol), alanine (2 mol), valine (3 mol), threonine (3 mol)
Infrared absorption spectrum: 3300, 2900, 1740, 1620 **1520,** 1220, 1150 cm^{-1}
Specific rotation: $[\alpha]_D^{23}$ + 22.4° (C : 6.5 percent in 50 percent methanol)
Bioautography: Rf = 0.9~0.95 (n-butanol: acetic acid: water = 3 : 1 : 1)
Ultraviolet: end absorption
Color reaction: Positive to biuret and tert-butyl hypochlorite, negative to ninhydrin, Fehling's solution and Molisch.

3,923,979

ANTIBIOTIC 60-6 AND PRODUCTION THEREOF

Jun'ichi Shoji, Hirakota; Mikao Mayama, Ikeda; Shinzo Matsuura, Itami; Kouichi Matsumoto, Toyonaka, and Yoshiharu Wakisaka, Takarazuka, all of Japan, assignors to Shionogi & Company, Ltd., Japan

Filed Apr. 15, 1974, Ser. No. 461,433
Claims priority, application Japan, Apr. 25, 1973, 48-47413
Int. Cl.² A61K 35/00
U.S. Cl. 424—118 **3 Claims**

1. An antibiotic, 60-6, effective in inhibiting the growth of gram-positive microorganism, the said antibiotic being colorless amphoteric powder which shows no definite melting point but progressively decomposes at over 190°C; contains the elements carbon, hydrogen, nitrogen and oxygen in substantially the following proportions by weight:

Carbon	53.91 %,	54.33 %
Hydrogen	7.72 %,	7.61 %
Nitrogen	14.27 %,	14.76 %;

has an optical rotation of $[\alpha]_D^{23.0}$ + 19.5 ± 3.5° (*c*=0.172 %, in dimethylformamide); has a molecular weight of 1600 and a neutralization equivalent of 1517; shows the formation of aspartic acid, threonine, serine, valine, alloisoleucine, tryptophane, γ-hydroxylysine, ammonia and a variety of fatty acids containing 12–16 carbon atoms on acid hydrolysis; and shows ultraviolet absorption (in methanol) at 275, 282 and 290.5 μ and an infrared absorption spectrum as in the attached drawing, FIG. 1.

3,923,980

ANTIBIOTIC A-2315 AND PROCESS FOR PREPARATION THEREOF

Robert L. Hamill, New Ross, and William Max Stark, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 276,546, July 31, 1972, abandoned. This application May 2, 1974, Ser. No. 466,327

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—118 9 Claims

1. Antibiotic A-2315 Factor A, said factor being a white amorphous solid having a specific rotation $[\alpha]^{27}D$ of −132 (*c* = 0.375 in methanol); having an approximate elemental composition of 61.51 percent carbon, 7.51 percent hydrogen, 8.69 percent nitrogen, and 21.53 percent oxygen; having an approximate molecular weight of 503 as determined by mass spectrometry; having in chloroform the following distinguishable bands in its infrared absorption spectrum: 2.81, 2.99, **3.38,** 5.82, 6.02, 6.20, 6.30, 6.40, 6.66, 6.82, 6.94, 7.05, 7.30, 7.71, 8.88, 9.11, 10.41, 10.89 and 11.14 microns; having in 95% ethanol solution an ultraviolet absorption maximum at 214 mμ with an absorptivity value ($E_{1\,cm}^{1\%}$) of approximately 799; being soluble in methanol, ethanol, and chloroform, but being only slightly soluble in water; releasing alanine upon amino-acid analysis; and containing hydroxyl groups which are capable of esterification.

3,923,981

ANTIBIOTIC MYC 8003

Cornelis Vos, Pijnacker, and Jacobus den Admirant, Delft, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Division of Ser. No. 344,610, March 26, 1973, which is a continuation-in-part of Ser. No. 170,516, Aug. 10, 1971, abandoned. This application Sept. 11, 1974, Ser. No. 501,863

Claims priority, application United Kingdom, Aug. 14, 1970, 39367/70

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—122 8 Claims

1. A growth-promoting composition for warmblooded animals comprising an animal feed containing a growthpromoting amount of a member of the group consisting of the antibiotic MYC 8003, which is a yellow, saltforming weak acid solid having the analysis: carbon, 63.8%; hydrogen, 7.6%; nitrogen, 3.5%; and oxygen, 25.1%; consisting of equilibrium-forming components, with an optical rotation $[\alpha]_D^{22}$ of −60° (1% methanolic solution), poorly soluble in carbon tetrachloride and benzene, soluble in chloroform, methyl isobutyl ketone, butyl acetate, ethyl acetate, methanol and alkaline solutions, insoluble in diethyl ether, petroleum ether, water and acid solutions, showing a slightly positive reaction in the aromate test, forming a red color with concentrated sulfuric acid, a dark brown color in the Pauly reaction, a dark red color and turbidity with ferric chloride, and precipitation with bromine water, showing gas production at 135°C, showing further gas production at about 152°C and showing a decomposition at 164°–174°C, showing in the ultraviolet region of the spectrum absorption maxima at 233, 276, 286 and 327 nm as in FIG. **1,** and in the infrared region, in KBr, absorption bands at 812, about 860, 940, 985, 1092, 1215, 1340–1380, 1460, 1540, **1640,** 2933, 2969 and about 3370 cm^{-1} as in FIG. **3** and an R_f value of 0.10 of the chief component, when chromatographed with a mixture of benzene, ethanol and 33% ammonia in the ratio of 65:40:9 and having the PMR spectrum of FIG. **4,** and its non-toxic, pharmaceutically acceptable salts.

3,923,982

PROCESS FOR PREVENTING TRACE ELEMENT DEFICIENCY IN ANIMALS AND COMPOSITIONS FOR CARRYING OUT SAID PROCESS

Michel Lamand; Claudine Lab nee Astier; Remy Roux, and Paul Chagnaud, all of Beaumont, France, assignors to Establissement Public Dit: Institut National de la Recherche Agronomique, Paris, France

Filed Sept. 19, 1973, Ser. No. 398,626

Claims priority, application France, Sept. 20, 1972, 72.33282

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—140 11 Claims

1. A method for controlling trace-metal deficiency in bovine and ovine animals, comprising the step of injecting, by intramuscular or subcutaneous route, to such animals having such deficiency an effective amount of a composition in the form of a suspension containing said trace-metals in a viscous and apyrogenous excipient, the suspended trace-metal being present as the free metal or an oxide thereof, being non-soluble in aqueous media, non-ionizable and capable of slow release after intramuscular or subcutaneous injection.

3,923,983

MEDICATED POULTRY COMPOSITION AND METHOD EMPLOYING CERTAIN SULFATE COMPOUNDS

Joseph Michael Pensack, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 561,053, June 28, 1966, Pat. No. 3,531,568, which is a continuation-in-part of Ser. No. 313,171, Oct. 2, 1963, abandoned. This application Aug. 3, 1970, Ser. No. 60,627. The portion of the term of this patent subsequent to Sept. 29, 1987, has been disclaimed.

Int. Cl.[2] A61K *33/04*

U.S. Cl. 424—164 2 Claims

1. A medicated poultry drinking water composition comprising water and a medicament selected from the group consisting of tylosin, 2-amino-5-nitrothiazole and 2-acetylamino-5-nitrothiazole and a sulfate of a cation carrying a single positive charge selected from the group consisting of sodium sulfate, sodium bisulfate, potassium sulfate, potassium bisulfate, ammonium sulfate, ammonium acid sulfate and sulfuric acid in an amount sufficient to provide from about 0.1 to about 1.0 percent by weight of sulfate ion in the water.

3,923,984

SHELF STABLE MULTI-USE COMPOSITION, PREPARATION AND USE

Carl J. Zuercher, deceased, late of Pinellas Park, Fla. (by Ernestine Zuercher, executrix), assignor to Beatrice Z. Atha, Richmond, Va.

Filed Feb. 11, 1974, Ser. No. 441,631

Int. Cl.[2] A61K *35/78*

U.S. Cl. 424—195 7 Claims

1. A process for the preparation of a shelf-stable multi-use pain relieving and burn healing composition which comprises:

a. preparing a solution of camphor and distilled water in a ratio of from about 20 to 30 grams of camphor per 128 ounces of distilled water;

b. preparing a healing agent solution of oil of sage, Dalmation and oil of thyme in a co-solvent mixture of water and a glycol containing a surfactant, said oil of sage, Dalmation and oil of thyme being present in an amount by volume of about 40 cc per 245 cc of the said healing agent-containing solution;

c. preparing a sweetener solution of ammoniated glycyrrhizin in a co-solvent mixture of water and a glycol, said sweetener being present in an amount of about 50 grams per 450 cc of the said co-solvent mixture;

d. preparing a pain-reliever solution of eugenol and a surfactant in a glycol solvent, said eugenol being present in an amount by volume of about 10 cc per 130 cc of the said pain reliever-containing solution;

e. preparing a flavoring agent solution of maltol in a co-solvent mixture of water and a glycol, the maltol being present in an amount of about 1 gram per 1001 cc of the said flavoring agent-containing solution;

f. mixing from about 5 to about 10 ounces of sorbitol and from about 3 to about 10 grams of tannic acid to the said camphor solution; and

g. mixing in thereafter from about 1 to about 4 ounces of the said healing agent and said antiseptic solution, from about ½ to about 2 ounces of the sweetener solution, from about 1 to about 4 ounces of the flavoring agent-containing solution, from about 1 to about 4 ounces of a humectant, from about ½ to about 3 ounces of the pain reliever solution.

3,923,985

PROCESS FOR THE PREPARATION OF 16α-METHYL-$\Delta^{1,4,9(11)}$-PREGNATRIEN-3,20-DIONES AND USE OF THE SAME IN TREATMENT OF ALLERGIES

Jacques Prost Marechal, Paris, and Georges Tomasik, Rosny-sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

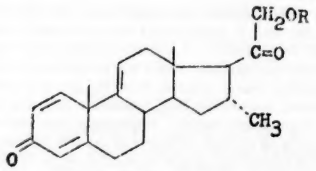
Filed July 24, 1974, Ser. No. 491,339

Claims priority, application France, July 27, 1973, 73.27578

Int. Cl.² A61K *31/56*

U.S. Cl. 424—243 **4 Claims**

1. Pharmaceutical compositions for the treatment of allergic reactions of seasonal or aperiodic rhinitis, spasmodic coughing, asthma and skin disturbances in warm-blooded animals comprising a minor amount of 16α-methyl-$\Delta^{1,4,9(11)}$-pregnatrien-3,20-dione having the formula



wherein R is a member selected from the group consisting of hydrogen and the acyl of an organic carboxylic acid having from 1 to 18 carbon atoms, and a major amount of a pharmaceutical excipient.

3,923,986

NITROGEN CONTAINING ACYCLIC ISOPRENOID COMPOUNDS IN PHARMACEUTICAL COMPOSITIONS

Silvia Tricerri Zumin, Como; Mario Riva, Monza, Milan, and Giuseppe Iafolla, Milan, all of Italy, assignors to Pierrel S.p.A., Milan, Italy

Division of Ser. No. 345,256, March 27, 1973, Pat. No. 3,875,163, which is a continuation-in-part of Ser. No. 271,067, July 12, 1972, abandoned. This application Sept. 18, 1974, Ser. No. 507,230

Claims priority, application United Kingdom, Feb. 21, 1973, 9348/73; Feb. 29, 1973, 9348/73

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 **13 Claims**

1. A pharmaceutical composition in dosage unit form containing an effective gastric antisecretory, anti-ulcer, analgesic of anti-inflammatory amount of a compound selected from the group consisting of N¹-piperonyl-N⁴-3,7,11-trimethyl-2,6,10-dodecatrienylpiperazine and a therapeutically acceptable non-toxic salt thereof and a non-toxic pharmaceutically acceptable carrier therefor.

3,923,987

PHARMACEUTICAL COMPOSITIONS CONTAINING AN N-FURYL-OR THIENYL-METHYL)- -OXY-7,8 -DIHYDRO-NORMORPHINONE OR NORCODEINONE AND METHOD OF USE

Herbert Merz; Adolf Langbein; Gerhard Walther, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

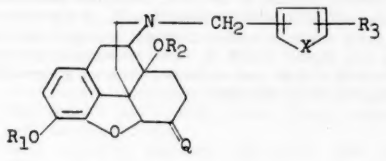
Division of Ser. No. 386,065, Aug. 6, 1973, Pat. No. 3,872,127. This application Jan. 16, 1975, Ser. No. 541,431

Claims priority, application Germany, Aug. 7, 1972, 2238839

Int. Cl.² A61K *31/485*

U.S. Cl. 424—260 **20 Claims**

1. An opiate antagonist composition in dosage unit form consisting essentially of an inert pharmaceutical carrier and an effective opiate-antagonistic amount of a compound of the formula



wherein

R_1 is hydrogen, methyl or acetyl,

R_2 is hydrogen or acetyl,

R_3 is hydrogen or methyl,

Q is oxygen, dimethoxy, diethoxy, ethylenedioxy or propylene(1,3)dioxy, and

X is oxygen or sulfur,

or a non-toxic, pharamacologically acceptable acid addition salt thereof.

3,923,988

2-(2-PYRIDYL)-ω-PHENYLALKYLAMINES

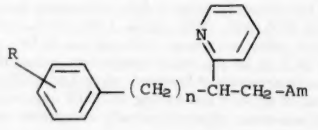
William John Welstead, Jr., and Burt Trosey Merriman, Jr., both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 293,863, Oct. 2, 1972, Pat. No. 3,814,641. This application Mar. 15, 1974, Ser. No. 451,569

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 **18 Claims**

1. A composition suitable for its gastric anti-secretory effect comprising (1) an effective amount of between 5.0 and 100 milligrams of a compound selected from those having the formula:



wherein;

Am is an amino radical selected from the group consisting of amino (-NH_2), di-lower-alkylamino, pyrrolidino, piperidino, and morpholino,

R is selected from the group consisting of hydrogen, fluorine, chlorine, bromine, methoxy and trifluoromethyl,

n is a positive integer from 1 to 2 inclusive, and the pharmaceutically acceptable acid addition salts thereof, and

2. a pharmaceutical carrier.

3,923,989

NITRO SUBSTITUTED PICOLINONITRILES AS ANTI-BACTERIAL AND ANTI-FUNGAL AGENTS

Paul L. Anderson, Dover, N.J., assignor to Sandoz Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 379,008, July 13, 1973, abandoned, which is a division of Ser. No. 207,558, Dec. 13, 1971, Pat. No. 3,770,751. This application Aug. 20, 1974, Ser. No. 498,955

Int. Cl.[2] A61K *31/44*

U.S. Cl. 424—263 **21 Claims**

1. A method of treating bacteria and fungi, which comprises internally or topically administering to a mammal in need of said treatment an anti-bacterial or anti-fungal effective amount of a compound of the formula:

or a non-toxic pharmaceutically acceptable acid addition salt thereof.

3,923,990

PHENYCYCLIDINE FOR INDUCING MYDRIASIS IN HUMANS

Mordechai Sokolovsky, 10 Rav Ashi St., Tel Aviv, and Saul Maayani, 7 Hahistadruth St., Givatayim, both of Israel

Filed July 30, 1973, Ser. No. 383,905

Claims priority, application Israel, Aug. 7, 1972, 40064

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **4 Claims**

1. A method of inducing mydriasis in humans for examination purposes, which comprises applying phencyclidine to an eye in an amount effective to dilate the pupil of the eye treated therewith.

3,923,991

1,6-BIS(2-PIPERIDINOETHOXY)XANTHENE-9-ONE HCL, HYDRATE IN THE TREATMENT OF INFLAMMATION

Arthur A. Santilli, Havertown; Anthony C. Scotese, King of Prussia; Stanley C. Bell, Penn Valley, and Marvin E. Rosenthale, Havertown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 256,034, May 23, 1972. This application Oct. 16, 1973, Ser. No. 406,996

Int. Cl.[2] A61K *31/33, 31/35, 31/445*

U.S. Cl. 424—267 **1 Claim**

1. A method of reducing inflammation in a mammalian host comprising orally administering to the host an effective amount of 1,6-bis(2-piperidinoethoxy)xanthen-9-one, dihydrochloride, hydrate.

3,923,992

ANALGETIC COMPOSITION AND METHOD OF USE

Thomas N. Riley, Oxford, Miss., and Danny B. Hale, Laverne, Tenn., assignors to The University of Mississippi, University, Miss.

Filed May 23, 1974, Ser. No. 472,528

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **2 Claims**

2. A process for raising the threshold of pain in mammal which consists essentially of administering to said mammal a composition consisting of the compound 1-(2-phenylethyl)-3-methyl-4-(N-propananilido)piperidine in admixture with a non-toxic pharmaceutically acceptable carrier, said compound being in a therapeutically effective concentration.

3,923,993

PROCESS FOR TREATING NEUROENDOCRINOPATHIC DISEASES EMPLOYING FLUSPIRILENE

Alan Corbin, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 374,454, June 28, 1973, Pat. No. 3,863,011. This application June 19, 1974, Ser. No. 480,777

Int. Cl.[2] A61K *31/44*

U.S. Cl. 424—267 **6 Claims**

1. A process for alleviating the clinical characteristics of an endocrinopathy induced by hypothalamic hyperfunction, which comprises chronically administering to a patient suffering from said endocrinopathy, orally or parenterally, the compound 8-[4,4-bis(p-fluorophenyl)butyl]-1-phenyl-1,3,8-triazaspiro (4.5) decan-4-one, in an amount sufficient to cause regression of the manifestations of said endocrinopathy as determined by physical observation and blood chemistry measurement.

3,923,994

ANTI-ARTHRITIC COMPOSITIONS COMPRISING A 3-ARYL 2-THIOHYDANTOIN AND METHODS OF PRODUCING ANTI-ARTHRITIC ACTIVITY

Arthur Magnani, Wynnewood, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

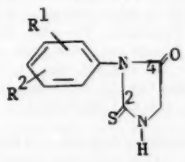
Filed July 13, 1973, Ser. No. 379,038

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 **11 Claims**

1. A tablet or capsule pharmaceutical composition having anti-arthritic activity, in dosage unit form, comprising a non-toxic pharmaceutical carrier and an effective but nontoxic amount of a 3-aryl-2-thiohydantoin of the formula:



in which R^1 and R^2 are hydrogen, chloro, bromo, fluoro or alkyl of one or two carbon atoms, at least one of R^1 and R^2 being other than hydrogen.

3,923,995

ANTICONVULSANT COMPOSITIONS CONTAINING DIPHENYLHYDANTOIN COMPOUNDS AND METHOD OF USING SAME

Carlos M. Samour, Wellesley, Mass., assignor to The Kendall Company, Walpole, Mass.

Division of Ser. No. 125,813, March 18, 1971, which is a division of Ser. No. 888,943, Dec. 29, 1969, which is a continuation-in-part of Ser. No. 749,972, Aug. 5, 1968, abandoned. This application May 24, 1974, Ser. No. 472,983

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 **10 Claims**

1. A therapeutic composition for treatment of convulsions in warm-blooded animals comprising a physiologically acceptable carrier and an amount sufficient to produce an anticonvulsant effect of a compound selected from the group consisting of 3-alkoxymethyl-5,5-diphenylhydantoin, 1,3-dialkoxymethyl-5,5-diphenylhydantoin and 3-benzyloxymethyl-5,5-diphenylhydantoin in which each alkoxy contains 1 to 12 carbon atoms.

3,923,996

3-SUBSTITUTED-OXINDOLES IN COMPOSITIONS AND METHODS OF TREATING OBESITY

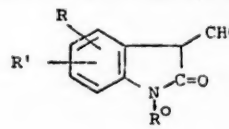
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 276,795, July 31, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 414,969

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **12 Claims**

1. The method of treating obesity in obese animals comprising administering to said animal an anti-obesity effective amount of a compound of the formula:



wherein

R^o is hydrogen or alkyl of 1 to 4 carbon atoms,

R is halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, and

R′ is hydrogen, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, or

R and R′ together form methylenedioxy,

or a pharmaceutically acceptable salt thereof.

3,923,997

PROCESS FOR REPELLING DOGS AND CATS FROM A SELECTED AREA OR FROM EACH OTHER USING γ-N-LKYL-γ-BUTYROLACTONES AND δ-N-ALKYL-δ-VALEROLACTONES

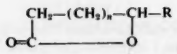
Walter C. Meuly, Piscataway Township, Middlesex County, N.J., assignor to Rhodia Inc., New York, N.Y.

Continuation of Ser. No. 142,395, May 11, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,332

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—279 **12 Claims**

1. A process for repelling dogs and cats from a selected area or from each other, which comprises applying to the surface of a selected area, dog or cat to be made repellent an amount sufficient to repel said dog or cat of a compound selected from the group consisting of γ-n-alkyl-γ-butyrolactone and δ-n-alkyl-δ-valerolactone having the formula:



wherein *n* is a number from 1 to 2, and R is a straight-chain alkyl group having from about two to eight carbon atoms.

3,923,998

CERTAIN TRIORGANOTIN COMPOUNDS USED TO COMBAT PLANT FUNGI

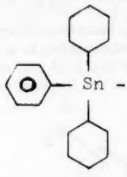
Melvin H. Gitlitz, Edison, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 311,509, Dec. 4, 1972, abandoned. This application July 10, 1974, Ser. No. 487,053

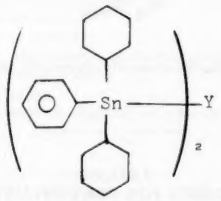
Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—288 **3 Claims**

1. A method for controlling plant fungi comprising contacting said fungi or their plant habitat with a fungicidally effective amount of a compound of the formula



or



wherein X represents a monovalent radical selected from the group consisting of chlorine, bromine, fluorine, hydroxyl, acetate, phenoxy, alkoxy (—OR^1) and mercaptide (—SR^2), wherein R^1 represents alkyl containing between 1 and 12 carbon atoms, inclusive, R^2 represents a radical selected from the group consisting of R^1 and phenyl and Y is selected from the group consisting of oxygen, sulfur and sulfate.

3,923,999

INSECTICIDAL COMPOSITIONS

Gotthard Synnatschke; Walter Gueckel, and Falk Rittig, all of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 1, 1973, Ser. No. 384,627

Claims priority, application Germany, Aug. 14, 1972, 2239898

Int. Cl.[2] A01N *9/12, 9/20, 9/24*

U.S. Cl. 424—300 **2 Claims**

1. A storage-stable insecticide powder composition comprising 1-naphthyl-N-methyl carbamate dispersed in a solid carrier and, as a dispersant therefor, 1 to 10% by weight, with reference to the solids content of said powder, of the water soluble sodium salt of the condensation product of 1 mole of o-cresol-sulfonic acid, 2 moles of urea and 10.6 moles of formaldehyde, subsequently condensed with 1 mole of o-cresol and 2 moles of formaldehyde.

3,924,000

INJECTABLE SOLUTION

Geraldine H. Thiele, Glen-Haven Farms, Rte. 1, Box 12, Windber, Pa. 15963

Continuation-in-part of Ser. No. 113,362, Feb. 8, 1971, Pat. No. 3,741,204, and Ser. No. 123,830, March 12, 1971, Pat. No. 3,767,812, and Ser. No. 283,663, Aug. 25, 1972, and Ser. No. 283,662, Aug. 25, 1972, Pat. No. 3,805,776, said Ser. No. 123,830, and Ser. No. 283,663, and Ser. No. 283,662, each is a continuation-in-part of Ser. No. 113,362, said Ser. No. 283,662, and Ser. No. 283,663, each is a continuation-in-part of Ser. No. 123,830,. This application June 12, 1973, Ser. No. 369,236The portion of the term of this patent subsequent to June 26, 1990, has been disclaimed.

Int. Cl. A61k *31/20*

U.S. Cl. 424—318 20 Claims

1. The process of treating a mosaic fracture of the bone and periosteum of man or animal which comprises injecting at least one dosage in an effective amount of a liquefied composition comprised of (a) a non-necrotic fatty acid compound, sclerosing agent and (b) a liquid carrier into the site of the fracture of the periosteum until there is a substantially complete bone union.

3,924,001

HYPOLIPIDEMIC 4-(MONOALKYLAMINO)BENZOIC ACID DERIVATIVES

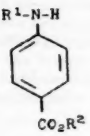
Jay Donald Albright, Nanuet; Stephen Joseph Riggi, Suffern, and Robert Gordon Shepherd, South Nyack, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 402,212, Oct. 1, 1973, Pat. No. 3,868,416. This application Oct. 25, 1974, Ser. No. 518,022

Int. Cl.[2] A61K *31/44*, *31/195*, *31/245*, *31/445*

U.S. Cl. 424—319 7 Claims

1. A method of treating hyperlipidemia in a mammal comprising administering to said mammal an effective serum lipid-lowering amount of a 4-(monoalkylamino) benzoic acid derivative of the formula:



wherein R^1 is an unbranched or branched alkyl group, C_nH_{2n+1} wherein n is 4 to 19; and R^2 is hydrogen, lower alkyl, benzyl, dilower akylaminoethyl or lower alkoxymethyl or a pharmaceutically acceptable salt thereof.

3,924,002

METHOD FOR COMBATTING HARMFUL MICROORGANISMS

Max Duennenberger, Frenkendorf, and Max Schellenbaum, Muttenz, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

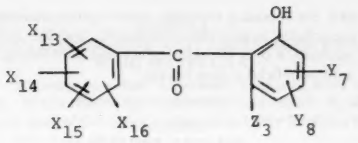
Division of Ser. No. 53,026, July 7, 1970, abandoned. This application Apr. 16, 1973, Ser. No. 352,379

Claims priority, application Switzerland, July 17, 1969, 10936/69

Int. Cl.[2] A61L *13/00*; D06M *13/12*

U.S. Cl. 424—331 6 Claims

1. A composition for combatting fungi and bacteria which comprises solid or liquid carrier and an inhibitory amount of a 2-hydroxybenzophenone of the formula



where Z_3 denotes an alkyl group with at most 2 carbon atoms or a chlorine or bromine atom, X_{13}, X_{14}, X_{15}, Y_7 and Y_8 each denote an an alkyl group with at most 2 carbon atoms or a hydrogen, chlorine or bromine atom, and X_{16} denotes a hydrogen, chlorine or bromine atom, with the number of the alkyl groups being at most 3.

3,924,003

SUBSTITUTED OR UNSUBSTITUTED P-ALKANOYL TOLUENES AS ANTI-OBESITY AND ANTI-DIABETIC AGENTS

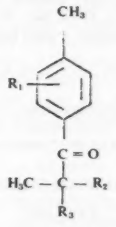
Robert S. Ho, Denville; William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, all of N.J., assignors to Sandoz Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 445,265, Feb. 25, 1974, abandoned. This application Feb. 3, 1975, Ser. No. 546,756

Int. Cl.[2] A61K *31/12*

U.S. Cl. 424—331 8 Claims

1. A method for treating obesity which comprises administering to a mammal in need of said treatment an anti-obesity effective amount of a compound of the formula:



where

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36, or straight chain lower alkoxy, and

R_2 and R_3 each independently represent alkyl having 1 to 2 carbon atoms.

3,924,004

FATTY ALCOHOL-PROPYLENE CARBONATE-GLYCOL SOLVENT CREAM VEHICLE

Kuang Y. Chang, Palo Alto, Calif., and Bonnie Ferrell, Clinton, N.Y., assignors to Syntex Corporation, Palo Alto, Calif.

Filed Nov. 24, 1971, Ser. No. 201,997

Int. Cl.[2] A61K *9/06*

U.S. Cl. 424—358 5 Claims

1. A substantially anhydrous vehicle composition consisting essentially of

a. from 5 to 40 weight percent of saturated fatty alcohol having from 16 to 24 carbons;

b. from 1 to 40 weight percent of propylene carbonate;

c. from 25 to 85 weight percent of glycol cosolvent, weight ratio of the glycol solvent to propylene carbonate being at least 1:2;

d. a stabilizing amount of surfactant;

e. from 0 to 15 weight percent of compatible plasticizer; and

f. from 0 to 3 weight percent water; said vehicle composition being particularly suitable for providing an occlusive

film, for releasing topically active cortico-steroids which are soluble in propylene carbonate, and for distributing medication over the skin surface and maintaining it there until beneficial action occurs.

3,924,005

SOLUBLE PROTEIN

Sven Ingmar Walton Bosund, Halsingborg, and Bengt Lennart Bengtsson, Bjuv, both of Sweden, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Canada

Filed May 21, 1973, Ser. No. 362,358

Claims priority, application United Kingdom, May 22, 1972, 23934/72

Int. Cl.[2] A23J *1/04*

U.S. Cl. 426—7 **7 Claims**

1. A process for preparing a fish protein isolate containing less than 0.5% by weight of lipids and which is water-soluble at all pH values comprising subjecting an aqueous slurry of comminuted fish material to enzymatic solubilization until less than 20% but greater than 0% by weight of the protein of said fish material is precipitatable at a pH of 4.5, precipitating undegraded proteins from the slurry by a step selected from the group consisting of acidifying said slurry to a pH of 4.0 to 5.0 and heating said slurry to a temperature above 70°C and separating the precipitated insoluble matter comprising undegraded proteins, lipo-proteins and lipids from the slurry to provide a solution of fish protein isolate.

3,924,006

ACTIVE DRIED YEAST

Frederick S. M. Grylls, Morden, England, assignor to The Distillers Company (Yeast) Limited, Surrey, England

Filed July 22, 1974, Ser. No. 490,445

Claims priority, application United Kingdom, July 23, 1973, 34950/73

Int. Cl.[2] A21D *2/02, 2/16;* **C12C** *11/18*

U.S. Cl. 426—24 **11 Claims**

1. A yeast composition comprising active dried yeast having admixed with it 0.5 to 2% by weight hydrophobic silicic acid, based on the dry weight of the yeast, and a minor amount of a wetting agent.

3,924,007

CONTINUOUS PREPARATION OF FERMENTED MILK PRODUCTS

Fransiscus M. Driessen, Ede; Jacobus J. Stadhouders, Bennekom, and Jacob Ubbels, Ede, all of Netherlands, assignors to Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek, Ede, Netherlands

Filed Apr. 9, 1973, Ser. No. 349,196

Claims priority, application Netherlands, Apr. 7, 1972, 7204690

Int. Cl. A23c *9/12, 17/00*

U.S. Cl. 426—43 **23 Claims**

1. A process for the continuous preparation of yoghurt comprising adding a continuous stream of milk to a fermenting mixture consisting of milk and starter in a prefermenting tank while maintaining the temperature of the mixture at 42°–48°C, transferring a similar quantity of the fermenting mixture which has a pH not below about 5.3 into a coagulating tank in which further fermentation and coagulation take place, cooling the fermenting mixture during passage into the coagulating tank, spraying the fermenting mixture into the coagulating tank, allowing the fermenting mixture to flow downward through the coagulating tank and coagulate and form a gel structure, and near the bottom of the tank where the acidity is sufficient to produce a pH of the gel structure of about 4.7 or below and the acidity is sufficiently high to prevent syneresis by stirring, stirring the gel structure near the bottom of the tank to form a smooth consistency without disturbing that part of the gel structure upstream in the coagulating tank in which sufficient acidity has not been produced, and subsequently filling containers with the resulting product through a discharge pipe in the bottom of the coagulating tank.

3,924,008

FLEXIBLE POUCHES FOR CARBONATED BEVERAGES

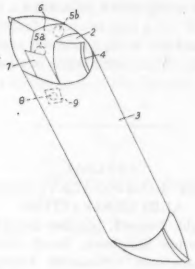
Andrew George Ford, Hitchin, and Dennis Ridley, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 21, 1972, Ser. No. 264,873

Claims priority, application United Kingdom, June 25, 1971, 29904/71; June 25, 1971, 29905/71; Dec. 30, 1971, 60732/71

Int. Cl.[2] B65B *31/02*

U.S. Cl. 426—123 **5 Claims**



1. A pouch for forming a pressurized package comprising a length of flattened tubular plastics film sealed at each end by a transverse linear seal, such that the pouch on inflation assumes a substantially cylindrical shape over the major part of its length with approximately saddle-shaped ends, and having an emptying port in each wall in an end part of the pouch, each port comprising a plurality of small holes in the wall of the pouch and each port being sealed by a removably-adhered strip of gas-tight flexible material extending across the end of the pouch, adhered across and around each emptying port to seal the holes but remaining substantially unattached to the pouch across the end thereof and the pouch having a filling aperture in its wall, in the part thereof that assumes a substantially cylindrical shape when the pouch is inflated.

3,924,009

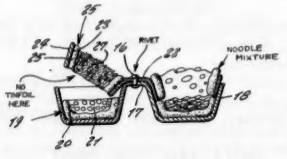
MINI KUGELET

Libby M. Goldberg, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007

Filed Aug. 27, 1973, Ser. No. 391,745

Int. Cl.[2] A23L *1/16*

U.S. Cl. 426—132 **2 Claims**



1. An adjustable food container in combinations with a plurality of food components adapted to combine interchangeably, comprising a pair of upper and lower metal foils,

wherein each of said foils include spaced circular cuplike depressions and central overlapping portions pivotally secured at the center thereof with a rivet, whereby the foils are relatively rotatable and the depressions on each foil are circularly arranged at the same radial distance from the rivet, said depressions having complimentary dimensions wherein each depression in the upper foil will nest and be supported in each opposing depression in the lower foil, said food components comprising edible shell enclosed units mounted in the depressions wherein the units in the upper and lower depressions are jointed when the depressions are in a nesting position to form contiguous shell enclosing food units of varying combination depending upon the relative rotational position of the foils, wherein the shells are formed from a noodle mixture.

3,924,010
METHOD FOR RIPENING FRUIT IN ATMOSPHERE OF ETHYLENE AND CARBON DIOXIDE

Ezra Erb, Edison, N.J., assignor to Union Carbide Corporation, New York, N.Y.

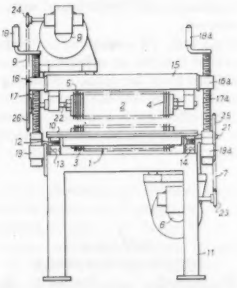
Filed July 27, 1973, Ser. No. 383,063
Int. Cl.[2] A23L *1/20*
U.S. Cl. 426—312 **2 Claims**

1. A process for ripening fruit comprising the steps of:
1. placing the fruit to be ripened into an enclosed chamber,
2. introducing into said chamber a gas mixture containing from about 1 to 7.3 wt.-% ethylene, and from about 92.7 to 99 wt.-% carbon dioxide, at a flow rate sufficient to maintain a concentration of at least 2.5 ppm of ethylene in the atmosphere within said chamber, and
3. maintaining said fruit in said chamber for a period of time sufficient to achieve the desired degree of ripening.

3,924,011
PROCESS OF TEXTURIZING MEAT MATERIAL

Jean-Paul Kern, Pfulgriesheim; Jacques Lemarechal, La Source, and Malcolm Desforges, Dingsheim, all of France, assignors to Unisabi S.A., Strasbourg-Neudorf am Rhine, France

Filed Aug. 23, 1973, Ser. No. 390,795
Claims priority, application France, Aug. 24, 1972, 72.30191
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—518 **5 Claims**

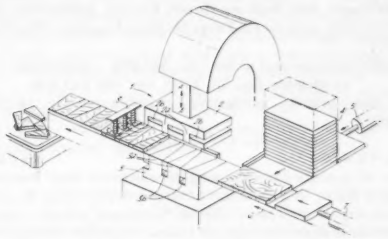


1. A process of imparting a fibrous meat textured appearance to the surface of shaped pieces about 1.5 to 2.5 cm thick of protein material selected from the group consisting of meat, offal, spleen, udder, lung and mixtures thereof having relatively smooth surfaces and no natural fibrous meat texture, comprising applying surface texturizing incisions to the surfaces of said pieces by cutting at least one series of parallel superficial incisions thereon conferring on the shaped protein pieces the appearance and structure of muscular tissue.

3,924,012
METHODS FOR FORMING UNIT PORTIONS OF FROZEN FOOD MATERIALS

Robert Swinburn Marshall, Lowestoft, England; Karl Hartmann, Bremerhaven-Speckenbuttel, and Erich Kraffert, Langen, both of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,524
Claims priority, application United Kingdom, Sept. 21, 1972, 43751/72; Apr. 6, 1973, 16736/73
Int. Cl.[2] B26D *5/00;* **A23P** *1/00*
U.S. Cl. 426—518 **8 Claims**

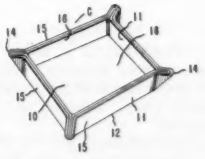


1. A method of forming unit portions from slabs of frozen food material, comprising the steps of bringing each slab in turn between opposing castellated jaws of a press having in each jaw alternate protruding and receding sections in which each protruding section has a substantial flat jaw face, a width corresponding to the required width of the unit portions and is shaped to closely intermesh with a receding section of the opposing jaw, bring the jaws together so that the protruding sections evenly contact the slab, and moving the jaws towards an intermeshing position so as to shear and thereby subdivide the slab into unit portions, said shearing resulting in a high shear stress developing along the plane between said unit portions and causing yield along said plane.

3,924,013
METHOD OF COOKING FOOD IN A POLYETHYLENE TEREPHTHALATE/PAPERBOARD LAMINATED CONTAINER

William Paul Kane, Bon Air, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 18, 1972, Ser. No. 281,943
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] A21B *3/15;* **B65D** *5/24*
U.S. Cl. 426—523 **2 Claims**



1. A method of cooking food including the steps of: providing a container formed from a blank formed from a laminate including paperboard having a layer of substantially amorphous polyethylene terephthalate extruded onto an uncoated surface thereof and wherein such surface is heated to a temperature of at least about 285°F. prior to such extrusion, said paperboad capable of being heated to a cooking temperature of up to about 400°F without browning, and said container being formed by folding the blank to bring surface portions of

the amorphous polyethylene terephthalate layer thereof into abutting contact with other surface portions of such layer and by heat-sealing these abutting surface portions together;

placing food in said container in contact with said layer of polyethylene terephthalate; and

cooking the food in said container at a temperature of up to about 400°F.

3,924,014

PROVOLONE CHEESE FLAVOR

Karl Heinz Ney, Hamburg-Rissen; I. Poetoe Gde Wirotama, Rellingen, and Wolfram Gustav Freytag, Halstenbek, all of Germany, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 345,058, , abandoned. This application Jan. 24, 1975, Ser. No. 543,838

Claims priority, application Luxembourg, Mar. 24, 1972, 65039

Int. Cl.² A23L *1/226*

U.S. Cl. 426—534 **10 Claims**

1. A process for imparting an improved ripe Provolone cheese flavor to a food composition selected from the group consisting of processed cheese, processed cheese preparations, fresh cheese, margarine cheese, creamed cheese, cheese fondu, and cheese powder, which comprises:

a. preparing a Provolone cheese flavoring composition by admixing

i. from 75 to 99 parts by weight of alkanoic acids having from 2 to 10 carbon atoms and consisting of from 35 to 70 percent by weight of butyric acid, from 15 to 35 percent by weight of hexanoic acid, from 15 to 30 percent by weight of an alkanoic acid selected from the group consisting of octanoic acid, decanoic acid and mixtures thereof, and the balance being other alkanoic acids having from 2 to 10 carbon atoms;

ii. from 0.01 to 0.2 parts by weight of alkyl alkanoates having an alkyl group with from 1 to 4 carbon atoms and an alkanoyl group with from 4 to 8 carbon atoms;

iii. from 0.05 to 0.5 parts by weight of alkyl amines and dialkyl amines having from 2 to 8 carbon atoms; and

iv. from 0 to 20 parts by weight of other cheese flavoring ingredients selected from the group consisting of 2-alkanones having from 4 to 11 carbon atoms, aldehydes having from 2 to 5 carbon atoms, primary and secondary aliphatic alcohols having from 2 to 10 carbon atoms, diacetyl, phenylacetaldehyde, methional, dimethylsulfide, indole, skatole, and 5-alkanolides having from 8 to 16 carbon atoms; and

b. admixing the mixture obtained by step (a) with said food composition in an amount of from 100 to 30,000 mg of cheese flavoring composition per kg of foodstuff.

3,924,015

FLAVORING AGENT

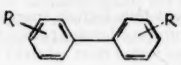
Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,821

Int. Cl.² A23L *1/226, 1/234*

U.S. Cl. 426—538 **24 Claims**

1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavor modifying amount of a compound selected from the group of compounds having the general formula:



wherein R is hydrogen or an methyl group.

3,924,016

COLORED AND FLAVORED COCONUT COMPOSITIONS

Larry A. Walters, Parma, Ohio, and George V. Daravingas, Edina, Minn., assignors to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 359,484, May 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 285,494, Aug. 31, 1972, abandoned. This application July 29, 1974, Ser. No. 492,471

Int. Cl.² A23L *1/275*

U.S. Cl. 426—540 **2 Claims**

1. In a colored and flavored coconut composition having a core of coconut meat, a water content of about 3 to about 25 percent by weight, a humectant selected from C_{3-6} polyhydric alcohols, and a flavorant, the improvement for retaining the effectiveness of said flavorant which comprises: a colorant layer of aluminum lake, calcium lake, or a mixture thereof overlaying said core, said colorant constituting from about 0.01 to about 4.0 percent by weight of said composition.

3,924,017

SWEETNESS INDUCER

Chi-Hang Lee, Spring Valley, N.Y.; Richard John Scarpellino, Ramsey, N.J., and Marjorie Mary Murtagh, Bronx, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 276,271, July 28, 1972, abandoned. This application Feb. 14, 1973, Ser. No. 332,527

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² A23L *1/22*

U.S. Cl. 426—548 **9 Claims**

1. A sweetness inducing composition comprising a salt selected from the group consisting of the alkaline earth, sodium, ammonium-based and ferric-based salts of cynarin and combinations thereof.

3. A food having induced sweetness comprising a foodstuff having incorporated therein an effective amount of a sweetness inducer selected from the group consisting of the alkaline earth, alkali metal, ammonium-based and ferric-based salts of chlorogenic acid, caffeic acid, cynarine, isochlorogenic acid, neochlorogenic acid and combinations thereof.

3,924,018

WHIPPED TOPPINGS

Rex J. Sims, Pleasantville, and Harold D. Stahl, Hartsdale, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed June 14, 1974, Ser. No. 479,325

Int. Cl.² A23L *1/00*

U.S. Cl. 426—564 **25 Claims**

1. A dry, low-pH whipped topping mix capable of being whipped at a pH below about 5 comprising: a fat encapsulated in a matrix of a carbohydrate and including an emulsifier system comprising a major amount of a first, strongly-hydrophilic, pH-sensitive emulsifier and a minor amount of a second, pH-insensitive emulsifier.

3,924,019

METHOD OF RAISED XEROGRAPHIC PRINTING AND PRODUCT

Ezekiel J. Jacob, 25 Monroe Place, Brooklyn, N.Y. 11201

Continuation-in-part of Ser. No. 100,516, Dec. 21, 1970, abandoned. This application July 16, 1973, Ser. No. 379,467
Int. Cl.[2] G03G *13/08, 13/22*
U.S. Cl. 427—14 7 Claims

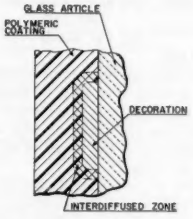
1. A method of producing raised images by xerographic means comprising the steps of (a) producing an electrostatic latent image on a xerographic member, (b) contacting said member with a dry, free-flowing, self-contained intumescent electroscopic toner mixture to develop said electrostatic latent image, (c) transferring the distributed toner from said member to a transfer surface and (d) subjecting said transferred toner to heat sufficient to cause intumescence thereof and thereby provide a permanent raised image on said surface.

3,924,020

METHOD OF MAKING AN OPTICAL WAVEGUIDE

Michael Thomas Duffy, Princeton Junction; Donald Jones Channin, East Windsor; and Jacob Meyer Hammer, Trenton, all of New Jersey, assignors to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,318
Int. Cl. C23C *13/02*
U.S. Cl. 427—162 11Claims



1. A method of making an optical waveguide comprising the steps of:

depositing a layer of single-crystal ZnO epitaxially on a flat surface of a substrate of sapphire,

polishing a surface of said ZnO layer,

providing a vapor source of lithium by melting lithium hydroxide at about 450°C, dehydrating the molten lithium hydroxide at about 600°C to form a white powder, and heating the white powder to about 1100°C for about fifteen minutes,

diffusing lithium from said vapor source into said ZnO layer in an oxygen ambient by heating said white powder adjacent said ZnO layer to a temperature of about 850°C while maintaining said ZnO layer at a temperature of between about 600°C and 800°C for between about one and five hours, and

applying a passivating film of aluminum oxide over said ZnO layer.

3,924,021

METHOD OF ELECTRON BEAM CURING OF COATED UNSATURATED SUBSTRATES CONTAINING SILICON CARBIDE

Tsutomu Maruyama, and Kazuo Yamashita, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Amagasaki, Japan

Continuation of Ser. No. 331,702, Feb. 12, 1973, abandoned. This application Feb. 14, 1974, Ser. No. 442,602
Claims priority, application Japan, Feb. 18, 1972, 47-16409
Int. Cl.[2] C08F *8/00*; C08G *18/00, 63/00*
U.S. Cl. 427—35 6 Claims

4. In a method for curing a coated substrate comprising the steps of applying a curable coating composition to a substrate, said coating composition comprising a radiation curable, film forming component having alpha, beta-olefinically unsaturated bonds, and irradiating said coated substrate using an electron beam, the improvement comprising employing from about 5 to about 30% by weight of silicon carbide in admixture with said film forming component which is effective in reducing the curing time and/or dosage requirements for curing said coating composition.

3,924,022

METHOD OF APPLYING AN ORGANIC COATING ONTO AN INORGANIC COATED STEEL SHEET FOR A MAGNETIC LAMINATE APPLICATION

Siegfried H. Schroeter, Schenectady, N.Y.; Jon Van Winkle, Dalton, and Carroll B. French, Lenox, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1974, Ser. No. 444,859
Int. Cl.[2] B05D *3/06*; H01F *27/24*
U.S. Cl. 427—54 3 Claims

1. A continuous, substantially pollution-free method for uniformly improving the surface resistivity of oriented steel strip having an inorganic material as a surface insulating coating to produce an oriented steel strip-inorganic coating-organic resin composite capable of providing an average Franklin test reading of from 0.1 to 0 amperes at a pressure of up to 300 psi, which comprises,

1. treating the oriented steel strip with an irradiation curable solventless organic resin to a thickness of up to 0.2 mil, and
2. passing the treated oriented steel strip through an irradiation curing zone at a rate of from 100 to 600 feet per minute, using an irradiation flux sufficient to effect the cure of the solventless organic resin to an organic resin hardness capable of being tested by the above-described Franklin test,

where said resin is characterized by having a viscosity of up to 3,000 centipoises at 25°C, and is a mixture consisting essentially of by weight from

A. 20 to 40% of a vinyl aromatic material selected from styrene, vinyl toluene, tert-butylstyrene and mixtures thereof,

B. 80 to 60% of an unsaturated polyester reaction product of (i) a glycol and (ii) an aliphatically unsaturated organic dicarboxylic acid, where

i. is a glycol selected from the class consisting of

a. a mixture of 20–60 mole percent of neopentyl glycol and 40–80 mole percent of a member selected from propylene glycol, ethylene glycol and mixtures thereof, and

b. a mixture of (a) 1 to 40% by weight thereof of trimethylolpropane monoallyl ether, and

ii. is an aliphatically unsaturated organic dicarboxylic acid consisting essentially of a mixture of 50 to 65 mole percent of fumaric acid and 35 to 50 mole percent of a member selected from tetrahydrophthalic anhydride, endomethylene tetrahydrophthalic anhydride and mixtures thereof

where there is utilized in making the unsaturated polyester reaction product of (B), up to at least about 10 mole

percent excess of the glycol of (i) over the aliphatically unsaturated organic dicarboxylic acid of (ii)

C. 1% to 5% based on the weight of (A) and (B) of a UV sensitizer, and

D. 0.05% to 1% based on the weight of (A), (B) and (C) of paraffin wax.

3,924,023

FLOOR TILE PRODUCTION AND PRODUCTS

Armen G. Boranian, Beacon, and Bruce Terwilliger, Newburgh, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 3, 1973, Ser. No. 347,439
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—54 **32 Claims**

1. A process for producing an improved vinyl asbestos or asphalt floor tile product comprising:

a. calendering a uniform mix of vinyl asbestos or asphalt floor tile ingredients to form a continuous sheet discharged from the calendering zone at a temperature of from about 110°F to about 180°F and at a travel rate of from about 80 ft./min. to about 200 ft./min.

b. printing a predetermined image on the exterior planar surface of the sheet during passage of said sheet through a printing zone essentially at the indicated travel rate;

c. coating the continuous sheet having the desired image printed thereon and traveling essentially at said travel rate with a fluid coating composition containing essentially 100% active ingredients and comprising at least one organic compound having at least two photo-polymerizable ethylenically unsaturated groups per molecule, said coating having a thickness of from about 0.001 inch to about 0.005 inch and being capable of curing upon exposure to ultraviolet light to form a hard, clear layer adhering to said sheet;

d. exposing the thus-coated sheet traveling essentially at said rate immediately to ultraviolet light having wavelengths within the range of from about 2500 A to about 4000 A in a non-oxidizing atmosphere at a temperature of from about 110°F to about 220°F, the radiation intensity level being sufficient to initiate the desired curing of the coating within an ultraviolet exposure time of from about 0.2 sec. to about 15 sec.; and

e. passing the thus-treated sheet traveling essentially at said rate to a cutting zone and therein cutting the thus printed, coated and treated sheet at a temperature of not less than about 120°F to form individual printed tiles having a clear wear layer thereon, the abrasion and scratch resistance properties of said coated tile both being significantly enhanced over said properties of the untreated base tile, the dimensional stability characteristics and resistance to curling of said coated tile being comparable to those of the untreated base tile, whereby the printed tile is produced with enhanced wear properties obviating the need for frequent waxing and protecting the printed exterior planar surface of the tile.

3,924,024

PROCESS FOR FABRICATING MNOS NON-VOLATILE MEMORIES

Charles T. Naber, Centerville, and William F. Blust, Middletown, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

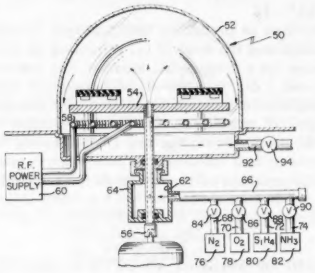
Filed Apr. 2, 1973, Ser. No. 347,155
Int. Cl.[2] B05D *5/12, 3/04*
U.S. Cl. 427—95 **14 Claims**

1. In a process for fabricating a silicon oxide-silicon nitride semiconductor memory device comprising:

thermally growing a layer of relatively thin silicon oxide at a temperature below approximately 1100° C in a dilute oxygen atmosphere on a selected surface area of a body of semiconductor material;

heating the layer of silicon oxide to a given temperature;

subjecting the layer of silicon oxide to an ammonia enriched atmosphere for a period of time only sufficient to remove substantially all the oxygen absorbed on the surface of the silicon oxide layer; and



depositing a layer of silicon nitride on the oxygen free surface of the heat treated silicon oxide layer immediately thereafter.

3,924,025

METHOD OF MAKING AN ELECTRODE HAVING A COATING OF COBALT METATITANATE THEREON

James M. Kolb, Mentor, and Kevin J. O'Leary, Cleveland Heights, both of Ohio, assignors to Electronor Corporation, Panama City, Panama

Division of Ser. No. 222,995, Feb. 2, 1972, Pat. No. 3,778,363, which is a continuation-in-part of Ser. No. 104,743, Jan. 7, 1971, abandoned. This application July 31, 1973, Ser. No. 384,210
Int. Cl.[2] B44D *1/18*
U.S. Cl. 427—126 **8 Claims**

1. A method of preparing an electrode which comprises:

a. applying a solution of salts of titanium, ruthenium and cobalt to an electrically-conductive substrate;

b. rapidly heating the substrate with applied solution to a temperature within the range of 425°–475°C and in the presence of oxygen;

c. maintaining the substrate at the said temperature for a period of time sufficient to thermochemically convert the salts to a coherent mixture of crystalline cobalt metatitanate with a valve metal oxide-precious metal oxide solid solution;

d. cooling the substrate;

e. applying any desired number of coatings of said solution in the manner of steps (*a*) to (*d*) and,

f. after thermochemical conversion of the last solution application, heating the substrate to a temperature of 525°–575°C for from 5 to 10 minutes,

whereby there is obtained an electrode bearing on at least a portion of its surface an electrically-conductive, electrocatalytically-active coating consisting essentially of a coherent mixture of crystalline cobalt metatitanate and a titanium dioxide-ruthenium dioxide solid solution.

3,924,026

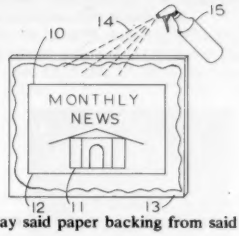
IMAGE PRESERVATION AND TRANSFER PROCESS

Henry S. Penfield, 1807 Delmar Drive, Garland, Tex. 75040

Filed Jan. 28, 1974, Ser. No. 437,192
Int. Cl.[2] B44C *1/16;* **B41M** *3/12;* **D44C** *1/00*
U.S. Cl. 427—146 **13 Claims**

1. A process of preserving a paper backed image comprising the steps of: saturating the paper backing with a barrier fluid that is a barrier to material penetration by a resin fluid, coating said image with a polymeric resin dissovled in an organic solvent, evaporating the organic solvent to leave a polymeric

resin film over said image and paper backing until said image adheres substantially completely to said resin film, and then



stripping away said paper backing from said image and said resin film.

3,924,027

PROCESS FOR THE PRODUCTION OF SENSITIZED SHEET MATERIAL

Toranosuke Saito, Kobe; Jujiro Kohno, Tokatsuki; Daiichiro Tanaka, Arao, and Shinichi Oda, Amagasaki, all of Japan, assignors to Sanko Chemical Company Ltd. and Kanzaki Paper Manufacturing Company Ltd., both of, Japan

Filed Sept. 27, 1973, Ser. No. 401,552

Claims priority, application Japan, Sept. 17, 1972, 47-97430

Int. Cl.[2] B41M *5/00*

U.S. Cl. 427—147 **12 Claims**

1. A process for the production of a sheet material for use in a pressure-sensitive copy system which comprises applying on a support sheet a suspension of a particulate mixture comprising (a) 100 parts by weight of an acidic organic substance selected from the group consisting of aromatic carboxylic acids and polyvalent metal salts thereof, and (b) from 5 –300 parts by weight of an organic high molecular compound selected from the group consisting of polystyrene, styrene copolymers, α-methylstyrene polymer, α-methylstyrene copolymers, polyvinyl chloride, vinylchloride copolymers, vinylidenechloride copolymers, polychloroprene, cyclopentadiene polymers, cyclopentadiene copolymers, acrylic ester polymers, acrylic ester copolymers, acrylic acid copolymers, methacrylic ester polymers, methacrylic ester copolymers, methacrylic acid copolymers, vinylacetate polymers, vinylacetate copolymers such as ethylene-vinylacetate copolymer, acrylonitrile copolymers, acrylamide copolymers, allylalcohol copolymers, benzylchloride polycondensation products, benzylchloride copolycondensation products, meta-xylene-formaldehyde condensates, diphenyl-formaldehyde condensates, and diphenyl-metal-xylene-formaldehyde copolycondensation products, said organic high molecular compound having a molecular weight of at least 400 and a non-fluidic property at normal temperature and being compatible with said acidic organic substance, and thereafter drying.

3,924,028

METHOD FOR IMPREGNATING AND COATING FIBROUS STRANDS

Gustav E. Benson, Edgewood, and Paul D. Yakuboff, Woonsocket, both of R.I., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 171,252, Aug. 12, 1971, Pat. No. 3,779,207. This application Apr. 20, 1973, Ser. No. 353,150

Int. Cl.[2] B65G *49/04*

U.S. Cl. 427—175 **4 Claims**

1. The method of combining a coating material with filaments of a strand comprising:

moving said strand through a path at a predetermined tension;

applying coating material to said strand; and

passing said strand into contacting relationship with a member of resiliently compressible and absorptive material so that the member is compressed by the tensioned strand such that the strand passes below the uncompressed

surface regions on either side of said strand of the member to remove excess coating material.

3,924,029

METHOD OF MODIFYING THE SURFACE PROPERTIES OF FINELY DIVIDED METAL OXIDES

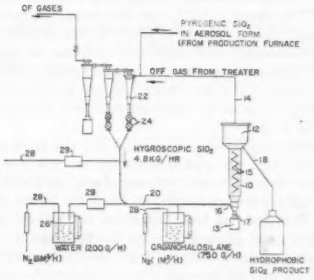
Dieter Schutte; Jean Diether, both of Rheinfelden, Germany, and Helmut Brunner, Princeton, N.J., assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation of Ser. No. 840,496, July 9, 1969, abandoned, which is a continuation of Ser. No. 633,307, April 24, 1967, abandoned, which is a continuation of Ser. No. 268,302, March 27, 1963, abandoned. This application Mar. 27, 1972, Ser. No. 238,518

Claims priority, application Germany, Mar. 30, 1962, 38532

Int. Cl. B44d *1/02*

U.S. Cl. 427—213 **5 Claims**



1. A process for producing hydrophobic finely divided fume silica which comprises the following steps in the specified sequence:

a. forming, in a first reaction zone, particles of a fume silica having a size of less than approximately 150 millimicrons by thermal decomposition and hydrolysis in the vapor phase of a volatile silicon halide, the said fume silica particles having an acidity corresponding to a pH of approximately 2.0, and including a hydrogen halide and water adsorbed on their surfaces,

b. passing the thus-produced fume silica particles out of the said first reaction zone and subjecting them to a deacidification and dehydration pretreatment to reduce their acidity to a value corresponding to a pH of approximately 4.0 by removing substantially all of the adsorbed hydrogen halide and water therefrom,

c. passing the thus-pretreated particles of fume silica together with water vapor into a second reaction zone into contact with a stream of hot gases containing substantial proportions of an organohalosilane while the second reaction zone is maintained at a temperature between approximately 400° and approximately 800°C and the particles therein are maintained in a fluidized state and maintained therein for a period sufficient to convert them to hydrophobic fume silica particles,

the foregoing step (c) of the process being performed in the absence of molecular oxygen, and

d. separating and recovering the hydrophobic fume silica particles thus produced from the hot gases and hydrogen halide formed from the organohalogenosilane while still continuing to exclude molecular oxygen from contact with the particles until the particles have cooled to a temperature below 400°C.

3,924,030

METHOD FOR PRODUCTION OF GLASS-FORMING MATERIALS

Seiji Tatara, Tokyo; Shozo Iwasa, Takaoka, and Shuichi Komura, Bandai, all of Japan, assignors to Nippon Soda Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 208,169, Dec. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 58,739, Feb. 27, 1970, abandoned. This application Aug. 16, 1973, Ser. No. 388,828

Int. Cl.² C03C *1/02*

U.S. Cl. 427—213 **6 Claims**

1. A method of preparing dustless glass-forming materials having a silica core surrounded by a sodium carbonate layer, which comprises:

a. fluidizing silica sand having less than 2 – 3 mm average grain size in a fluid bed reaction zone by passing gas containing from about 4% to about 15% by volume CO_2 through a tuyere plate inclined at 1° to 7° downwards from one end to the other end of said zone to form a fluidized bed of silica sand over said tuyere plate, maintaining said fluidized bed at a temperature from 300°C to 700°C by introducing said gas at a temperature of about 700°C to about 1,200°C into said fluid bed reaction zone through said tuyere plate at 60 cm/sec to 150 cm/sec;

b. simultaneously and uniformly spraying an aqueous sodium hydroxide solution in a ratio of silica sand to sodium hydroxide of 0.5 to 6 mole ratio of SiO_2/Na_2O from the upper portion of the reaction zone into the fluidized bed of silica sand;

c. continuously feeding silica sand into the lower portion of said fluidized bed and onto the top surface of the inclined tuyere plate from said one end of said zone and removing said glass-forming materials from the lower portion of said fluidized bed from the other end of said zone while the hot gases passing through the fluidized bed from the tuyere plate and escaping from the upper portion of said zone are passed through a collection zone and the grain and dust in the escaping gas collected therein; and,

d. recycling back into said fluidized bed said grain and dust collected in said collection zone.

3,924,031

METHOD FOR METAL COATING DIAMONDS SO AS TO IMPROVE THE INTERFACIAL BOND STRENGTH

Michael G. Nicholas, Wantage; Peter M. Scott, Newbury, both of England, and Bruce I. Dewar, Johannesburg, South Africa, assignors to De Beers Industrial Diamond Division Limited, Johannesburg, South Africa

Filed Mar. 22, 1973, Ser. No. 343,806

Claims priority, application United Kingdom, Mar. 22, 1972, 13426/72; Mar. 22, 1972, 13427/72

Int. Cl.² B05D *7/00*

U.S. Cl. 427—217 **1 Claim**

1. A method of producing a metal coated diamond particle including the steps of applying to an uncoated diamond particle a layer which in the as-applied condition is an alloy comprising a major proportion of a metal selected from copper, nickel and iron and a minor proportion of a carbide-forming metal selected from titanium, chromium and vanadium sufficient to form a continuous carbide layer around the diamond particle, and heat treating the particle to a temperature in the range of from 500°C. to a temperature just below the melting point of the alloy for a time sufficient to produce a continuous bonding carbide layer at the alloy/diamond interface and an interface bond strength in excess of 10 kg/mm², the steps being carried out in a non-oxidizing atmosphere.

3,924,032

SURFACE MODIFICATION OF SILICA PARTICLES

William Hertl, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,007

Int. Cl.² B05D *7/00*

U.S. Cl. 427—220 **7 Claims**

1. A method of modifying the surface of a high surface area silica material having available surface silanol groups which comprises the steps of reacting the material at an elevated temperature in an essentially inert atmosphere with carbon tetrachloride vapors to form surface chloride groups and then reacting the chlorinated surface of the material with vapors of a low molecular weight alcohol, the chlorination step and the subsequent reaction with the alcohol vapors being carried out in a sealed furnace capable of receiving vapors of the carbon tetrachloride and alcohol under reduced pressure and without the introduction of air or moisture.

3,924,033

PROCESS FOR THE PRODUCTION OF SHEET MATERIALS WITH REVERSIBLE ABSORPTIVITY FOR MOISTURE VAPOR

Rudolf Gaeth, Limburgerhof; Friedrich Hoelscher, Ludwigshafen; Bernard Schmitt, Kirchzarten, and Dieter Blum, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 100,779, Dec. 22, 1970, abandoned. This application Jan. 2, 1973, Ser. No. 320,261

Claims priority, application Germany, Dec. 30, 1969, 1965587

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B05D *3/02*

U.S. Cl. 427—226 **13 Claims**

1. A process for the production of sheet materials which absorb moisture vapor reversibly, which comprises applying an aqueous dispersion of a polymer, which contains polymerized units of at least 5% by weight of a tert-butyl ester of an ethylenically unsaturated carboxylic acid at a pH of 1.5 or less to gas permeable sheet materials and heating at the decomposition temperature of the polymer to thereby eliminate an olefin and form free carboxylic groups in the polymer.

7. A process as set forth in claim 1 wherein some or all of the carboxyl groups exposed by said thermal decomposition are neutralized by salt formation.

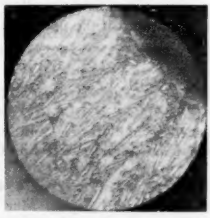
10. A process as set forth in claim 1 wherein the carboxyl groups exposed by said thermal decomposition are reacted with a reactive polyfunctional compound.

3,924,034

PROCESS OF MAKING PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES

Eugene L. Olcott, Falls Church, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Division of Ser. No. 65,899, Aug. 21, 1970, Pat. No. 3,738,906.
This application Nov. 27, 1972, Ser. No. 309,640
Int. Cl. B29h *17/28*; C23c *11/00*
U.S. Cl. 427—228 6 Claims



3. The process of claim 1 in which the hydrocarbon gas is methane.

3,924,035

TREATING METAL WITH A CLEANING AGENT IN A COMBUSTIBLE SOLVENT BEFORE COATING

Russell C. Miller, Chicago, Ill., assignor to J. M. Eltzroth & Associates, Inc., Schaumburg, Ill.

Filed Nov. 19, 1973, Ser. No. 417,259
Int. Cl.² C23F *17/00*; B08B *7/00*
U.S. Cl. 427—327 6 Claims

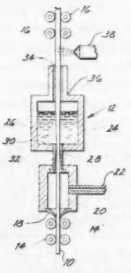
1. A process of cleaning a metal in the form of wires, rods, tubes, flat sheets and coiled sheets, which comprises bringing said metal into contact with a flame produced by the combustion of a gaseous fuel under superatmospheric pressure in the presence of a metal cleaning agent dissolved in a combustible liquid solvent at controlled temperatures and for periods of time and under conditions sufficient to cause combustion of said solvent and to clean said metal simultaneously with the combustion of the solvent and provide a surface adapted to receive a protective coating, without destroying the physical properties of the metal, and thereafter removing said metal from said flame.

3,924,036

METHOD OF CONTINUOUS CASTING

Marcel V. Carrara, Seymour, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,760
Int. Cl.² C23C *1/00*
U.S. Cl. 427—431 3 Claims



1. A method of continuously casting copper, comprising the steps of: passing a metal core member comprising copper upwardly into and through a crucible containing molten metal comprising copper, said core member entering the crucible containing molten metal comprising copper through a bushing member consisting essentially of a molybdenum alloy of at least about 99 percent by weight of molybdenum and about 0.25 to about 1.0 percent by weight of titanium and about 0.04 to about 0.2 percent by weight of zirconium, and thereby accreting and solidifying molten metal comprising copper on the core member, and removing the metal core member with the accreted and solidified molten metal comprising copper thereon from the crucible and cooling it.

3,924,037

METHOD FOR MAKING ARTIFICIAL STONE

Wayne S. Sullivan, 509 S. Gilbert St., Iowa City, Iowa 52240

Filed Apr. 15, 1974, Ser. No. 460,912
Int. Cl.² A47G *33/08*
U.S. Cl. 428—15 11 Claims

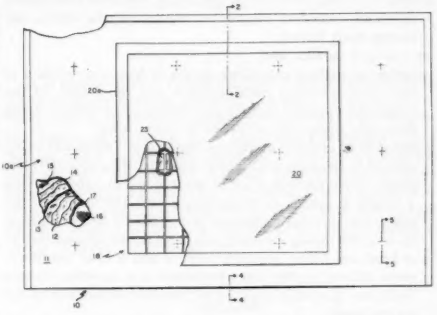
1. A method for making artificial stone using pieces of gypsum or cement board, said method comprising: breaking said board into random sized pieces within a size-range of approximately the desired size of the finished stones; applying to each of said pieces a semi-liquid mixture of cement, a binder, water and a low density fine aggregate; and allowing said mixture to dry to form the stones.

3,924,038

FRAGMENT SUPPRESSION CONFIGURATION

Edward H. McArdle, Media, Pa., and Ralph John Millidge, Florissant, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 12, 1974, Ser. No. 478,810
Int. Cl.² B32B *7/02*
U.S. Cl. 428—49 6 Claims



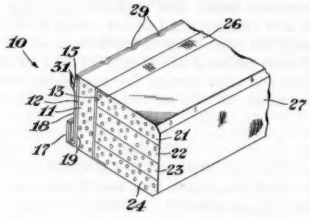
1. A lightweight projectile suppression/ ballistic shield for protecting personnel and equipment, and parked aircraft and other vehicles from exploding fragments and other projectiles being fired, comprising; a first, relatively soft and base-supporting, secondary protective element composed of a ballistic blanket having at least two relatively enlarged and unbonded layers of a ballistic nylon felt material providing a primary resilient, and auxiliary kinetic energy-absorbing and principal cushioning support means, a relatively narrow, lamination nylon cloth layer interposed between, and thereby providing a partial supporting and separating surface between the said ballistic nylon felt layers, and ballistic nylon cloth back and face side portions constituting an integral part of said ballistic blanket and being in respective contacting relation to and thereby providing for the complete and total support to said nylon felt layers, when taken in concert with the partial support being given thereto by said interposing nylon cloth lamination layer, to thus positively enable and ensure the unbonded configuration of said nylon felt layers; and a second, relatively hard and brittle, primary protective and kinetic energy-absorbing element incorporating a principal fragmen-

tation and other projectile-penetration resistant surface means comprised of a plurality of relatively small and regularly-spaced ceramic or tile elements adhesive bonded to the central portion of the face said portion of said blanket and being shatterable on the impact therewith with a certain predetermined force of fragments and other projectiles of exploding devices for thus absorbing a significant portion, if not all, of the kinetic energy being produced thereby.

3,924,039
CRYOGENIC CONSTRUCTION AND ARTICLE THEREFOR

Hubert Stacy Smith, Jr., Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 1, 1972, Ser. No. 302,839
Int. Cl. E04b *1/62;* **F16l** *59/12*
U.S. Cl. 428—119 **7 Claims**



1. An elongate insulating member having
a generally rectangular cross-sectional configuration, the eleongate member comprising
a first or facing body of an insulating material comprising synthetic resinous closed cell thermoplastic foam, the facing body having
an external surface and
an internal surface extending across at least one surface of the cross-sectional configuration and the length of the body, the external surface and the internal surface being generally oppositely disposed to each other,
a plurality of internal members, the internal members being affixed to the internal surface and extending generally the entire width thereof, each of the internal members having a length generally commensurate with the length of the body, the internal members being affixed to the internal face of the facing member and in adjacent relationship to at least one other internal member and a fiber reinforcement affixed to the inner members at a location remote from and generally parallel to the internal surface of the facing body.

3,924,040
EMBOSSED NEEDLE-BONDED FABRIC WALL COVERINGS

Lee W. Addie, Millersville, and Harold W. Nikolaus, Columbia, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

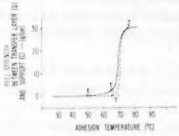
Filed May 31, 1974, Ser. No. 475,326
Int. Cl.² B32B *5/06, 3/00*
U.S. Cl. 428—141 **1 Claim**

1. A fabric consisting of:
a. a scrim which has a first melt temperature and a generally open weave configuration of approximately 8–10 yarns per square inch,
b. on the upper surface thereof a felted non-woven fabric of randomly laid synthetic fibers needle-bonded to the scrim and of a melt temperature approximately 50°F below the melt temperature of the scrim; and
c. the upper surface of the felted fabric being provided with a definite embossed pattern on a part thereof, said pattern extending substantially through the felted fabric to the scrim surface, and non-embossed areas having a textured surface effect which is the result of a softening and partially melting of the felted fabric to allow it to assume the general surface contour of the underlying scrim.

3,924,041
HEAT-SENSITIVE RECORDING MATERIAL AND PROCESS FOR PRODUCING SAME

Masuo Miyayama; Mineyuki Murase, and Harumi Shiraiwa, all of Shizuoka, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1974, Ser. No. 454,534
Claims priority, application Japan, Mar. 23, 1973, 48-32704
Int. Cl.² B41M *5/26*
U.S. Cl. 428—212 **14 Claims**



1. A heat-sensitive recording material comprising a support (A) having thereon a transfer layer (B) and a support (C) in turn, said supports having the property that before heating the adhesion strength between the transfer layer (B) and the support (C) is smaller than the adhesion strength between the transfer layer (B) and support (A) and larger than 0.1 g/cm but, after heating to a temperature higher than the heat-sensitive temperature of the transfer layer (B), the adhesion strength between the transfer layer (B) and support (C) becomes greater than the adhesion strength between support (A) and transfer layer (B), and said transfer layer (B) comprising, at least on the side thereof in contact with support (C), a heat-sensitive composition containing as a major component a mixture of a heat-sensitive substance which becomes fluid at the heat-sensitive temperature of the heat-sensitive substance and an adhesiveness-imparting agent which can adhere to support (C) at a temperature not higher than the heat-sensitive temperature of said heat-sensitive substance.

10. A process for producing a heat-sensitive recording material, which comprises applying support (A) and support (C) onto opposite sides of transfer layer (B) at a temperature, for support (C), not higher than the heat-sensitive temperature of said heat-sensitive composition of layer (B) and not lower than the adhesiveness-generating temperature of layer (B), said support (A), transfer layer (B) and support (C) having the property that before heating the adhesion strength between layer (B) and support (C) is less than the adhesion strength between support (A) and layer (B) and greater than 0.1 g/cm but, after heating to a temperature higher than the heat-sensitive temperature of the transfer layer (B), the adhesion strength between layer (B) and support (C) becomes greater than the adhesion strength between support (A) and layer (B), and said transfer layer (B) comprising at least at the side thereof in contact with support (C) a heat-sensitive composition containing as a major component a mixture of a heat-sensitive substance which becomes fluid at the heat-sen-

sitive temperature of the heat-sensitive sheet and an adhesiveness-imparting agent which can impart sufficient adhesiveness to adhere to support (C) at a temperature lower than the heat-sensitive temperature of said heat-sensitive substance.

3,924,042

METHOD FOR TREATMENT OF BACTERIAL PLANT DISEASE

John F. Gerster, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

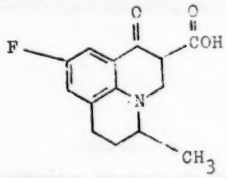
Filed Mar. 26, 1973, Ser. No. 344,479

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² A01N *9/00, 9/22*

U.S. Cl. 424—258 **2 Claims**

1. A method for controlling plant disease caused by *Erwinia amylovora*, *Xanthomonas pruni* or *Pseudomonas glycinea* which comprises contacting the foliage of a plant or drenching the soil surrounding a plant with at least an effective, non-phytotoxic controlling amount of a carboxylic acid of the formula



or horticulturally acceptable metal, amine or ammonium salt thereof.

3,924,043

PRESSURE SENSITIVE ADHESIVES OF POLYMERS OF CYCLOALIPHATIC AND PHENYLALKYL ACRYLATES AND VINYL ESTERS

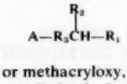
Ramsis Gobran, Roseville; Hanspeter Knoepfel, and Spencer F. Silver, both of White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 836,946, June 26, 1969, Pat. No. 3,751,449. This application Apr. 19, 1973, Ser. No. 352,568

Int. Cl. C09J *7/02*

U.S. Cl. 428—261 **7 Claims**

1. A pressure sensitive adhesive sheet material comprising a flexible backing sheet having applied thereto a pressure sensitive layer of a polymer of a compound of the formula



where A is acryloxy or methacryloxy, R_1 is cyclohexyl, cyclopentyl, or cyclopentenyl, R_2 is a hydrogen atom or lower alkyl, and R_3 is an alkylene having at least 4 carbon atoms extending in a chain.

3,924,044

SHEET MATERIAL COATED WITH ADHESIVES FROM CYCLOALIPHATIC AND PHENYLALKYL ACRYLATES AND VINYL ESTERS

Ramsis Gobran, Roseville Village; Hanspeter Knoepfel, and Spencer F. Silver, both of White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 352,567, April 19, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,781

Int. Cl.² C09J *7/02*

U.S. Cl. 428—355 **6 Claims**

1. A pressure sensitive adhesive sheet material comprising a flexible backing sheet having applied thereto a pressure sensitive layer of a polymer of a compound of the formula

where A is carbovinyloxy, R_1 is a cycloaliphatic group having 5 or 6 ring member atoms, R_2 is a hydrogen atom or lower alkyl, and R_3 is an alkylene having 4 to 9 carbon atoms extending in a straight chain.

3,924,045

MULTI-LAYER CONJUGATE FIBER AND PROCESS AND APPARATUS FOR THE PREPARATION THEREOF

Masafumi Ogasawara; Masanori Akita, both of Otsu; Kazuhiko Saito, Kusatsu; Yoshikazu Kikuchi, and Mitsuhiro Shiokawa, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 19, 1974, Ser. No. 443,506

Claims priority, application Japan, Feb. 26, 1973, 48-22246; Mar. 31, 1973, 48-37155; Apr. 6, 1973, 48-38765

Int. Cl.² B29F *3/10;* **D02G** *3/00*

U.S. Cl. 428—373 **15 Claims**

1. A multiple layer conjugate fiber comprising at least two different fiber forming synthetic polymers, wherein the synthetic polymers are successively arranged along the length of the fiber and each has an annular ring-like shape in cross section and a substantially parabolic interface in longitudinal side section, wherein the distance between tips of central components having parabolic curved surfaces is at least about 0.1m, and wherein two different synthetic polymers are used and the relative weight percentages of the two is within the range of about 20/80 to 80/20.

3,924,046

DYES AND PIGMENTED ARTICLES WHEREIN THE FIXING AGENT IS A POLYMER BASED ON N-FORMYL--ACRYLOYL-METHYLENEDIAMINES

Joachim Ribka, Offenbach am Main-Burgel; Steffen Piesch, Oberursel, Taunus; Friedrich Engelhardt, Frankfurt am Main; Gerhard Pfeiffer, Kelkheim, Taunus; Peter Klinke, Oberurse, Taunus, and Wolfram Schidlo, Diedenbergen, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Oct. 23, 1973, Ser. No. 408,487

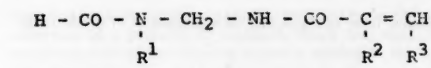
Claims priority, application Germany, Oct. 23, 1972, 2251923

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C08F *16/34;* **C09B** *65/00;* **D06P** *1/52*

U.S. Cl. 428—375 **6 Claims**

1. A dyed or pigmented fiber or film having the dye or pigment fixed thereto by a fixing agent, said fixing agent being a thermally crosslinked polymer of a linear addition polymer, said linear additional polymer being selected from the group consisting of (1) a linear additional homopolymer of a monomer of the formula



wherein R^1, R^2 and R^3 are hydrogen or alkyl having 1 to 5 carbon atoms and (2) a linear addition copolymer containing from about 0.2 to 50 percent by weight of said monomer of said formula and at least one copolymerizable olefinically unsaturated monomer.

3,924,047

ORGANIC RESIN COATED GLASS FIBERS COATED WITH UNSATURATED FATTY ACID ESTER

John E. Ward, Jr., Granville, and Bordie B. Garick, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 129,194, March 29, 1971, abandoned. This application Feb. 27, 1973, Ser. No. 336,390

Int. Cl.² D02G *3/00*

U.S. Cl. 428—378 **10 Claims**

9. In glass fiber reinforcements of the type to be used for reinforcing thermoplastic and/or thermosetting resin matrix forming materials, and wherein the glass fiber reinforcements have a coating of a resinous material from the group consisting of polyvinyl acetate, polyvinyl chlorides, polyesters having acid or alcohol groups, polyamides, and aldehyde condensates, the improvement comprising: a second coating over the organic resinous coating, said second coating consisting essentially of a hydrolyzable unsaturated fatty acid ester of a polyglycol having water molecules hydrogen bonded thereto to act as a fugitive processing aid which prevents clumping of the glass fiber reinforcements and is hydrolyzed when the resin matrix is subsequently heat bonded thereto at a pressure above approximately 35 psi and a temperature corresponding to the saturated steam temperature at this pressure.

3,924,048

ROADSTONE

John William Carson, North Rigton, England, assignor to Albright & Wilson Limited, Oldbury, near Birmingham, England

Filed Aug. 2, 1972, Ser. No. 277,449

Claims priority, application United Kingdom, Aug. 4, 1971, 36551/71; Apr. 20, 1972, 18318/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B32B *19/00*

U.S. Cl. 428—404 **10 Claims**

1. A roadstone consisting essentially of:

a. a granular substrate having a particle size of at least 1mm of refractory metamorphic and igneous rocks, slags, shales, pit residues, concrete, devitrified soda glass, coarse crushed refractory brick, chrome ore, iron ore, bauxite or ceramics; and

b. from 1 to 50 percent by weight of the total stone of a sintered coating upon the said substrate, said coating consisting essentially of hard particles having a diameter of less than 1mm of spinels, bauxite or finely crushed refractory brick.

9. A method for the production of roadstone which comprises mixing together a granular substrate having a particle size of at least 1 mm of refractory metamorphic and igneous rocks, slags, shales, pit residues, concrete, devitrified soda glass, coarse crushed refractory brick, chrome ore, iron ore, bauxite or ceramics with from 1 to 50 percent by weight of a coating composition consisting essentially of hard particles having a particle size of between 5 and 300 microns of spinels, bauxite or finely crushed refractory brick, and heating the mixture to a sintering temperature between 1,000°C and 1,600°C.

3,924,049

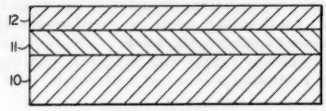
MULTICOLOR THERMOSENSITIVE PAPER

James K. Truitt, Dallas, and Robert C. Goodman, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 30, 1973, Ser. No. 383,922

Int. Cl.² B41M *5/18*

U.S. Cl. 428—411 **10 Claims**



1. A heat sensitive, sheet material, comprising:

a. a supporting substrate;

b. a first layer of a first color of heat actuable material, responsive to a first quantity of heat to change to a second color; and

c. a second layer of a normally substantially opaque coat overlaying the first layer, responsive to a second quantity of heat less than the first quantity of heat to be transparentized.

3,924,050

DIELECTRIC LAYER COMPOSITION

Carolyn J. Camp, Livermore, and Robert O. Lindblom, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 173,299, Aug. 19, 1971, Pat. No. 3,779,982. This application June 29, 1973, Ser. No. 374,847

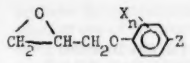
Int. Cl. B32b *27/38*

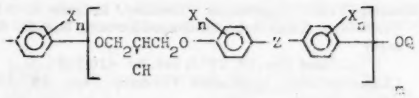
U.S. Cl. 428—413 **1 Claim**

1. A paper suitable for use in electrostatic printing processes comprising an electrographic paper coated on at least one side with an effective amount of a dielectric coating composition consisting essentially of

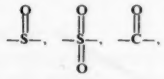
A. 15 to 85 volume % of a copolymer of 70 to 96 weight % vinylidene chloride, the remainder being at least one other olefinically unsaturated comonomer polymerizable therewith, said copolymer having a molecular weight described by a relative viscosity of between about 1.2 and 3.5 for a 1% tetrahydrofuran solution at 25°C.;

B. 8 to 77 volume % of an epoxy resin having an epoxy equivalent weight of about 400 to 60,000, said epoxy resin being of the formula



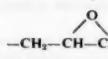


wherein each —Z— is a chemical bond, —O—, —S—, —S—S—,



—CH_2— or

Q is H or



each X is Cl or Br; each *n* is 0 to 2; and *m* is about 1 to 210; and

C. 0 to 42 volume % of a pigment.

3,924,051

ORIENTED SARAN COEXTRUDATE

Glenn C. Wiggins, Midland; Marvin J. Kreh, Essexville; Fred Stevenson, Beaverton, all of Mich., and Davis, Robert S., Lewiston, N.Y., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 70,524, Sept. 8, 1970, abandoned, which is a continuation of Ser. No. 630,889, April 14, 1967, abandoned. This application Mar. 24, 1972, Ser. No. 237,953The portion of the term of this patent subsequent to Dec. 26, 1989, has been disclaimed.

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B32B *27/08*

U.S. Cl. 428—520 **3 Claims**

1. A bilaterally oriented plastic laminate consisting essentially of (1) a first layer of a vinylidene chloride-vinyl chloride copolymer containing a predominant amount of vinylidene chloride in the copolymer molecule and (2) a second layer of an ethylene-unsaturated ester type copolymer containing a predominant amount of ethylene in the copolymer molecule and wherein said unsaturated ester is selected from the group consisting of vinyl acetate and isobutyl acrylate, said first layer and said second layer being non-separable with tape and said laminate being prepared by coextruding said first layer and said second layer as a plural layered tube, chilling said tube at a temperature of about 5°C to about 25°C and then tempering said tube at a temperature of about 20°C to about 50°C immediately prior to blowing said tube into a bubble with a fluid whereby the molecules of said copolymer are bilaterally oriented and wherein the total area of said bubble is at least about 16 times the area of said tube.

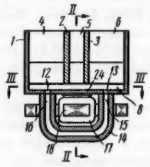
3. The laminate of claim 1 with a further layer of said ethylene-unsaturated ester type copolymer.

ELECTRICAL

3,924,052
INDUCTION FURNACE

Viktor Konstantinovich Pogorsky, ulitsa Poligraficheskaya, 24 a, kv. 247, and Vitaly Petrovich Polischuk, ulitsa Vernadskogo, 85, kv. 122, both of Kiev, U.S.S.R.

Filed June 7, 1974, Ser. No. 477,273
Int. Cl.² H05B *5/14*
U.S. Cl. 13—29 **4 Claims**

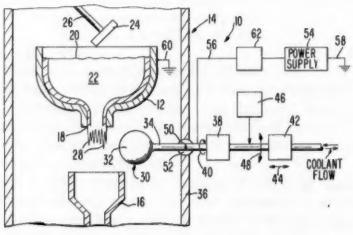


1. An induction furnace comprising a crucible whose walls and bottom define a space for molten metal; vertical partitions subdividing said space into at least three chambers, two of which flank at least one intermediate chamber; a tray for discharging the molten metal from said at least one intermediate chamber, fixed on an upper section of its wall; said bottom of the crucible being made as at least one chute section, open from above and intercommunicating said chambers; a detachable metal conduit with a substantially U-shaped duct communicating with the flanking chambers of said crucible space; a closed magnetic circuit having a winding encompassed by said conduit; and at least one open magnetic circuit having windings wound on respective pole pieces encompassing said at least one chute section, disposed under said at least one intermediate chamber.

3,924,053
APPARATUS AND METHOD FOR CLEANING AND SEALING OF BOTTOM POUR CRUCIBLE

Max P. Schlienger, San Rafael, Calif., assignor to Schlienger, Inc., San Rafael, Calif.

Filed Nov. 25, 1974, Ser. No. 526,658
Int. Cl.² F27D *3/14, 15/00*
U.S. Cl. 13—33 **15 Claims**

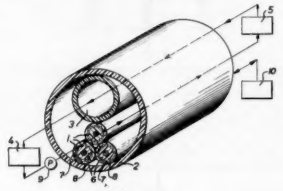


1. Apparatus for cleaning the opening at the bottom of a bottom pour crucible comprising: a rotary arc electrode; means coupled with the electrode for mounting the same for rotation and for movement along a path across and adjacent to said opening of the crucible; means coupled with said electrode for rotating the same and for moving it along said path; and means coupled with said electrode and adapted to be coupled with said crucible for establishing an electric arc therebetween, whereby the heat from the arc will clean the opening as the electrode rotates and moves along said path.

3,924,054
CURRENT CONDUCTING SYSTEM HAVING ADJUSTABLE HEAT DISSIPATION CAPABILITY

Henning Falke, Angermund, Germany, assignor to AEG-Telefunken Kabelwerke Aktiengesellschaft, Rheydt, Germany

Filed Nov. 19, 1973, Ser. No. 416,815
Claims priority, application Germany, Nov. 18, 1972, 2257133
Int. Cl.² H01B *7/34*
U.S. Cl. 174—15 C **13 Claims**



1. A system for transmitting electrical energy by means of power cables installed in pipelines and capable of efficiently conducting a plurality of current amplitude ranges, comprising, in combination:

at least one single conductor power cable having plastic insulation and at least one closed metal sheath; a pipeline in which said cable is installed and normally filled with air when said cable is to conduct current in the lowest amplitude range; first means for selectively introducing a hygroscopic water-containing medium into said pipeline when said cable is to conduct current in an intermediate one of such plurality of amplitude ranges; and second means for selectively circulating a coolant through said pipeline when said cable is to conduct current in the highest of such plurality of amplitude ranges.

10. A method for controlling the current-carrying capacity of a cable disposed in a pipeline for permitting the cable to conduct current efficiently in any one of a plurality of amplitude ranges, the cable being constituted by at least one single conductor power cable having plastic insulation and covered by at least one closed metal sheath; said method comprising, selectively: filling the pipeline with air when the cable is to conduct current in the lowest of such plurality of amplitude ranges; introducing a hygroscopic water-containing medium into the pipeline when the cable is to conduct current in an intermediate one of such plurality of amplitude ranges; and removing any water-containing medium present in the pipeline and circulating a coolant through the pipeline when the cable is to conduct current in the highest of such plurality of amplitude ranges.

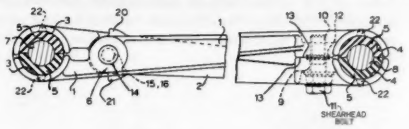
3,924,055
CABLE SPACER FOR OVERHEAD POWER TRANSMISSION LINES

Edwin Barclay Moore; Bernard Oliver Crossley, both of Leicester, England, and Roy Leonard Gladwell, Crofton, Md., assignors to Dunlop Limited, England

Filed Oct. 21, 1974, Ser. No. 516,678
Claims priority, application United Kingdom, Oct. 27, 1973, 50120/73
Int. Cl.² H02G *7/12*
U.S. Cl. 174—40 R **6 Claims**

1. A cable spacer for use between pairs of sub-conductors in overhead power transmission lines comprising a pair of similar lever arms, each lever arm having two semi-circular section grooves with a resilient lining, one groove being provided at either end of the lever arm, a pivotal connection between the lever arms, said pivotal connection being located

between the semi-circular section grooves on each arm and adjacent one of the grooves, the axis of the pivotal connection being parallel to the groove axis and arranged such that relative pivotal movement of the lever arms causes the grooves at the ends adjacent to the pivot to come together and form a first circular aperture for engaging a first sub-conductor and



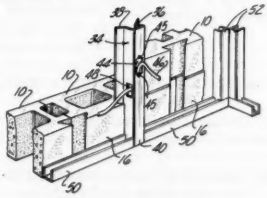
the grooves at the other end to form a second circular aperture for a second sub-conductor, a fixing means extending between the arms for locking the arms in engagement with each other, and mechanical stops adjacent to the conductor grooves at the ends of the lever arms remote from the pivotal connection so that in the closed position the relative positions of the lever arms are independent of the fixing means tension.

3,924,056

SLOTTED MASONRY WALL STRUCTURE AND METAL STUD THEREFOR

James T. LoCicero, 1836 Millard Drive, Madison Heights, Mich. 48071

Filed Dec. 13, 1973, Ser. No. 424,353
Int. Cl.[2] H02G *3/28;* **E04B** *2/00*
U.S. Cl. 174—48 **13 Claims**



1. Building apparatus comprising: a building block adapted to be assembled with similar blocks to form a substantially continuous structure, said block being constructed of substantially rigid material and having bearing surfaces and exterior surfaces, at least one of the exterior surfaces having formed therein a slot extending between the bearing surfaces; a relatively thin-wall, open channel stud adapted to be snapped into the slot, said stud being of a substantially three-sided configuration to define an exposed box portion and contiguous oppositely flared non-parallel manually deformable resilient flanges which are urged toward one another for installation of the stud into the slot and which are dimensioned to fit resiliently and snugly against the walls of the slot when inserted therein, the box portion and flanges being of such depth as to cause the exposed portion to be spaced from the interior surface of the slot in the block when the stud is fully inserted therein such that the exposed portion of the stud may receive elongated fastener devices therein after installation; and means for spreading the sides of the studs contiguous with the flanges to rigidify the stud within the block.

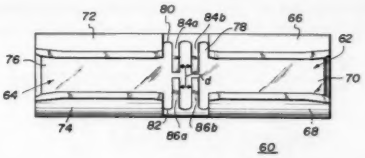
3,924,057

BUTT-TYPE COMPRESSION CONNECTOR

Charles W. Sosinski, Linden, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Nov. 29, 1974, Ser. No. 528,360
Int. Cl.[2] H02G *15/08*
U.S. Cl. 174—94 R **2 Claims**

1. A butt type compression connector comprising: a first conductor receiving portion at least partially defined by a first edge; a second conductor receiving portion at least partially defined by a second edge; said first and second conductor receiving portions arranged to be crimped to at least one electrical conductor placed in each of said first and second conductor receiving portions; web means coupled to at least a portion of said first edge of said first conductor receiving portion and to at least a portion of said second edge of said second conductor receiving portion to hold said first and



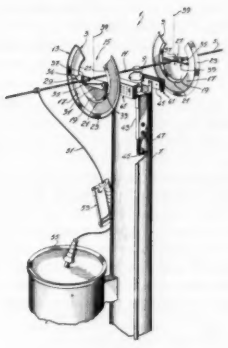
second conductor receiving portions in spaced apart linear alignment; and wire stop means extending transversely across said web means to prevent the engagement of the ends of conductors crimped within each of said first and second conductor receiving portions; said wire stop means comprising two pairs of fingers, one pair of fingers extending inwardly from each of the two marginal edges of said web means; one pair of fingers providing a wire stop for its adjacent one of said first and second conductor receiving portions.

3,924,058

DEIONIZING DEVICE FOR AERIAL ELECTRIC LINES

Rosario Dube, 85 Lac Dube Ste. Ursule, cte, Maskinonge, Quebec, Canada (J0K3M0)

Filed June 26, 1974, Ser. No. 483,448
Int. Cl.[2] H01B *17/42*
U.S. Cl. 174—140 R **7 Claims**



1. A deionizing device comprising:
- at least one first, plate-like, electrode member,
- means on said first member for detachably mounting said member on an electrical power line with said member being substantially perpendicular to the line when mounted thereon, the mounting means being located on the member in a position such that when the member is mounted on the electrical line, a substantial portion of the area of the member is on one side of a plane containing the electrical line,
- a second, plate-like, electrode member adapted to be mounted in parallel spaced relation to the substantial portion of the area of the first member, and means for grounding the second electrode member.

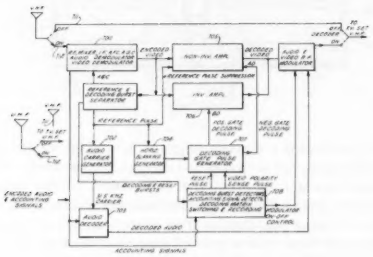
3,924,059
PAY TELEVISION SYSTEMS

Irving Horowitz, Eatontown, N.J., assignor to Teleglobe Pay TV System Inc., Rego Park, New York, N.Y.

Division of Ser. No. 227,582, Feb. 18, 1972, Pat. No. 3,824,332. This application Dec. 28, 1973, Ser. No. 429,216The portion of the term of this patent subsequent to July 16, 1991, has been disclaimed.

Int. Cl.[2] H04N *1/44*

U.S. Cl. 178—5.1 **6 Claims**



1. Apparatus for encoding a standard composite television signal having video signals for conveying the picture to be televised, said video signals having amplitudes varying between a first and second reference level respectively signifying picture black and white, said standard composite television signal further having horizontal and vertical synchronizing signals occurring during horizontal and vertical blanking intervals for synchronizing the television receiver to the television transmitter, said synchronizing signals having determined synchronizing levels and polarities relative to a determined one of said first and second reference levels, comprising, in combination, first transmitter circuit means having a signal input for receiving said composite television signal, an output, and a control input for receiving a control signal, for transmitting said composite television signal from said input to said output in such a manner that the polarity of said video signals relative to said selected one of said reference levels remains unchanged or is reversed throughout at least the subsequent field in dependence upon a control signal; controls means connected to said circuit means for furnishing a plurality of control signals, each during a randomly selected one of said vertical blanking intervals and applying said control signal to said control input of said first circuit means; and additional transmitter circuit means connected to said first transmitter circuit means and said control means for applying a coding signal to said composite television signal at a determined time instant in each of said randomly selected vertical blanking intervals in response to each of said control signals, thereby creating a coded composite television signal.

3,924,060
CONTINUOUS INFORMATION ADD-ON SYSTEM

Alan D. Bedford, St. Paul, Minn., assignor to Hazeltine Research, Inc., Chicago, Ill.

Filed June 24, 1974, Ser. No. 482,381

Int. Cl.[2] H04N *7/00*

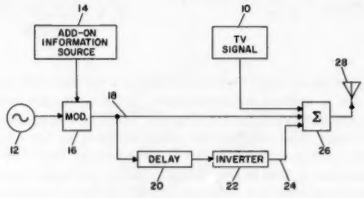
U.S. Cl. 178—5.6 **17 Claims**

1. A system for compatibly transmitting and receiving both a TV signal and an add-on signal within the frequency band occupied by the TV signal, comprising:

means for supplying a TV signal occupying a predetermined frequency band and containing video information during time successive line intervals;

means for supplying a signal representative of selected add-on information;

means, responsive to said add-on information representative signal, for generating first and second modulated add-on signal components in phase quadrature at a common carrier frequency lying within a selected portion of said frequency band, wherein the modulation of said first add-on signal component is representative of said selected add-on information during time successive line intervals and wherein during each line interval the modulation of said section add-on signal component is representative of identical but opposite polarity add-on information as that represented by the modulation of said first add-on signal component during corresponding portions of the preceding line interval;



means for combining said TV signal and said first and second add-on signal components to develop a combined TV and add-on signal suitable for transmission in a common frequency band to a remote receiver;

means for receiving said combined signal;

and means for processing said received combined signal to develop an output signal primarily representative of said selected add-on information.

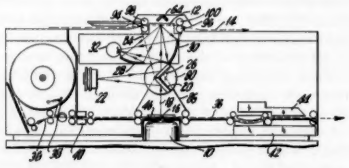
3,924,061
FACSIMILE TRANSCEIVER UTILIZING SINGLE LIGHT SOURCE

John L. Tregay, Weston, Conn., and Paul Z. Boros, New York, N.Y., assignors to Comfax Communications, Inc., New York, N.Y.

Filed June 11, 1974, Ser. No. 478,259

Int. Cl.[2] H04N *1/22, 1/42*

U.S. Cl. 178—6 **24 Claims**

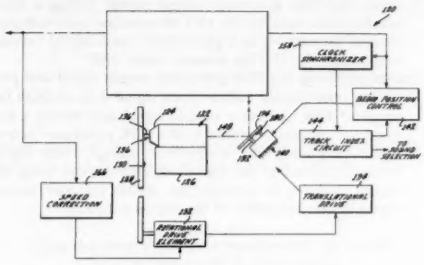


1. A facsimile transceiver capable of operating in a transmission mode in which information contained on a document or the like is transmitted to a remote receiver, and a reception mode in which information received from a remote transmitter is reproduced on a print paper, said transceiver comprising a source of a scanning beam directed along a scan axis, means for moving during said transmission mode the document along a first path substantially perpendicular to said axis and remote from said source to a scanning location at which said scanning beam is incident on the surface of said document, and for moving during the reception mode the print paper along a second path spaced along said axis from said first path, and substantially perpendicular to said axis, and into substantial contact with said beam source, and means positioned intermediate said first and second paths for directing said beam onto the document at said scanning location during said transmission mode, whereby said scanning beam is caused to scan over the document during said transmission mode and over the print paper during said reception mode.

3,924,062
DISC RECORD WITH SKIPPED STANDARD VIDEO INCREMENTS AND CONTINUOUS AUDIO INCREMENTS AND A METHOD AND APPARATUS FOR REPRODUCTION

Kent D. Broadbent, San Pedro, Calif., assignor to MCA Disco-Vision, Inc., Universal City, Calif.

Filed Oct. 24, 1972, Ser. No. 299,892
Int. Cl.² H04N *5/76*
U.S. Cl. 178—6.6 R **11 Claims**



1. An extended play video disc record comprising:

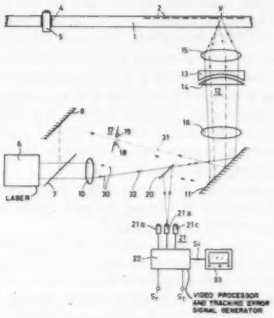
a disc member having a substantially planar disc surface with variable characteristics portions representing a standard increment of video information recorded thereon, and including more than one standard increment of audio information recorded simultaneously therewith, said variable characteristics portions being discontinuities out of the plane of the surface corresponding to information, said discontinuities being generally disposed in a substantially circular path, each discontinuity having a constant dimension in the radial direction and a constant maximum dimension in the direction perpendicular to said surface, the length of each discontinuity in the circumferential direction and the distance between adjacent discontinuities in the circumferential direction representing the stored information and collectively forming a plurality of mutually spaced information tracks extending circumferentially around the disc, representing an ordered, segmented video program, whereby each standard increment of video information is adapted to be read more than once, each time with a different audio information standard increment to provide a continuous program presentation.

3,924,063
VARIABLE OPTICAL WEDGE FOR SCANNING A LIGHT BEAM IN AN APPARATUS FOR READING AN OPTICALLY ENCODED DISC

Carel Arthur Jan Simons, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,732
Claims priority, application Netherlands, Feb. 13, 1974, 7401937
Int. Cl.² H04N *5/76*; **G11B** *7/12*
U.S. Cl. 178—6.6 R **3 Claims**

1. An apparatus for reading a record carrier on which information is stored in an optically readable structure of areas and intermediate regions which are arranged along tracks, of the type wherein the apparatus includes a radiation source which supplies a read beam, an objective system for focussing the read beam to a read spot on the optical structure of the record carrier, a beam deflecting element for moving the read spot with respect to the record carrier, and a radiation-sensitive detection system for converting the read beam which is modulated by the areas and intermediate regions into an electrical signal, the improvement wherein the beam-deflecting element comprises an assembly of a plano-concave lens and a plano-convex lens, the concave surface of the first lens facing the convex surface of the second lens, said plano-convex and plano-concave lens surfaces having substantially the same radius of curvature and are disposed at a distance which is substantially smaller than said radius of curvature, a first axis associated with said plano-convex lens and being defined as a line perpendicular to the optical axis of the objective system and passing therethrough, a second axis associated with said plano-convex lens and being defined as a line passing through the first axis and through the optical axis of the objective system and perpendicular to both the first axis and the optical axis of the objective system, a third axis associated with said

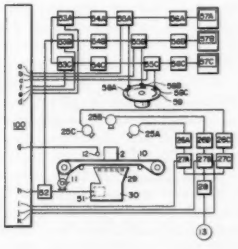


plano-concave lens and being defined as a line parallel to the first axis and passing through the optical axis of the objective system, a fourth axis associated with said plano-concave lens and passing through the optical axis of the objective system parallel to said second axis, two of said first through fourth axes that are perpendicularly oriented being pivotal axes, the lens associated with the particular pivotal axis being pivotally mounted to angularly move about said associated axis, one of the pivotal axes being parallel to the section of track on which the objective system is focussed, said lens assembly being in the vicinity of a pupil of said objective lens.

3,924,064
X-RAY INSPECTION EQUIPMENT FOR BAGGAGE

Yasuji Nomura; Koichi Koike, and Kazuo Yamamoto, all of Kashiwa, Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Mar. 26, 1974, Ser. No. 454,920
Claims priority, application Japan, Mar. 27, 1973, 48-34785; Mar. 27, 1973, 48-24786
Int. Cl.² H04N *7/18*
U.S. Cl. 178—6.8 **6 Claims**



1. A low X-ray level baggage inspection apparatus comprising:

conveyor means for continuously conveying articles of baggage to be inspected in a path along a longitudinal direction;

plural X-ray tubes positioned along said path;

separate generating means coupled to each of said X-ray tubes for generating plural X-rays toward different portions of each article of baggage from plural directions;

a single image regenerating means, positioned adjacent said path to receive said plural X-rays after having passed through said each article of baggage, for producing plural X-ray images of the contents of said each article of baggage;

video signal means connected to said image regenerating means for converting said X-ray images into corresponding primary video signals;

at least one recording-reproducing means coupled to said video signal means for recording said primary video signals and for subsequently reproducing the thus recorded signals as corresponding secondary video signals;

at least one display means coupled to said recording-reproducing means for displaying said secondary video signals as corresponding visual images of said X-ray images;

at least one controlling means coupled to said recording-reproducing means for controlling the recording and reproducing functions thereof;

position detecting means for detecting when said each article of baggage is carried by said conveyor means to a predetermined position; and

control device means, coupled to and operable by said position detecting means, and coupled to said generating means for activating said X-ray tubes to emit pulsed X-rays to irradiate said each article of baggage from said plural directions in a predetermined order at said predetermined position, and coupled to said controlling means for activating said controlling means when said generating means is activated to cause said recording-reproducing means to record one field primary video signal and to thereafter repeatedly reproduce said one field signal until a subsequent primary video signal is produced.

3,924,065

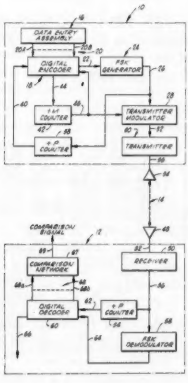
COHERENT, FIXED BAUD RATE FSK COMMUNICATION METHOD AND APPARATUS

Charles C. Freeny, Jr., Forth Worth, Tex., assignor to Information Identification, Inc., Fort Worth, Tex.

Filed Apr. 5, 1974, Ser. No. 458,330

Int. Cl.[2] H04L *27/10*

U.S. Cl. 178—66 R **43 Claims**



25. A frequency shift key (FSK) communication apparatus for communicating time division binary message codes comprising a predetermined number of message bits, having logic levels representing logical "ones" and logical "zeros," from a transmitter station to a receiver station, the apparatus comprising:

a digital encoder, having a predetermined message code comprising a predetermined number (N) message bits, generating at least two output signal levels for each message bit of the N-bit message code at a digital encoder output signal;

an FSK generator receiving the digital encoder output signal and providing an output signal having a distinct frequency in response to each received digital encoder output signal level, the FSK generator output signal having a fixed transmission time for the (N) bit message code independent of the number of logical "ones" and logical "zeros" comprising the (N) bit message code; and

means receiving the FSK generator output signal and providing a transmitter master clock signal derived from the received FSK generator output signal and having a frequency coherently related to the FSK generator output signal frequency, the transmitter master clock signal being connected to the digital encoder and operating the digital encoder to provide the digital encoder output signal in one condition of the digital encoder.

3,924,066

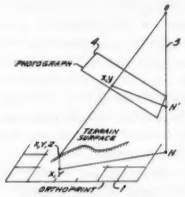
ORTHOPRINTER USING NADIR LINE SCANNING

Walter E. Chapelle, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 15, 1974, Ser. No. 442,701

Int. Cl.[2] H04N *1/04, 1/10*

U.S. Cl. 178—6.7 R **9 Claims**



1. In a device for printing an orthophoto from a photograph, the device having means for scanning the photograph and means for printing the orthophoto, the improvement comprising means for controlling the scanning and printing means to scan the photograph and print the orthophoto along nadir lines.

3,924,067

AUTOMATIC BEAM CURRENT LIMITER WITH VIDEO HOLD-OFF

Blayne E. Arneson, Evergreen Park, Ill., assignor to Admiral Corporation, Chicago, Ill.

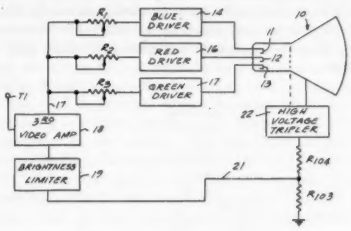
Filed Aug. 16, 1974, Ser. No. 497,879

Int. Cl.[2] H04N *3/16, 9/16*

U.S. Cl. 178—7.5 DC **6 Claims**

1. A circuit for automatic beam current limiting and video hold off for a television receiver including a cathode ray tube whose cathodes are unheated prior to turn on comprising, a power source, a video amplifier connected to supply drive to the cathode ray tube of said receiver, a brightness limiter means connected to said video amplifier to control its output, means for sensing the beam current in said cathode ray tube

connected to said brightness limiter means to control its output, and time delay means connected to said brightness limiter

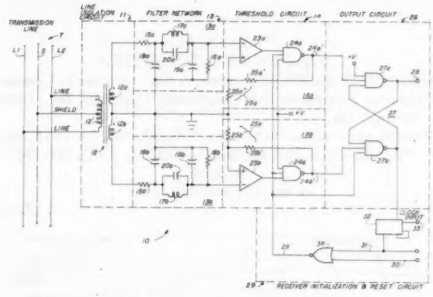


means and said power source and delaying the application of power to said brightness limiter means at turn on.

3,924,068
LOW DISTORTION RECEIVER FOR BI-LEVEL BASEBAND PCM WAVEFORMS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of George E. Proch, Houston, Tex.

Continuation-in-part of Ser. No. 428,994, Dec. 27, 1973. This application Apr. 26, 1974, Ser. No. 464,720
Int. Cl.[2] H04L *13/18*
U.S. Cl. 178—88 **11 Claims**



1. A receiver for a zero direct current input signal transmitted as the output signal from a remotely located transmitter comprising:

a. duplicating and inverting means for providing an inverted signal which has the same amplitude as that of the receiver input signal but is 180° out-of-phase with said receiver input signal;

b. processing means in said receiver for processing said receiver input signal and said inverted signal for symmetrically processing positive and negative going transitions of said receiver input signal;

c. filter means including frequency responsive circuit means in said processing means fr symmetrically filtering and band limiting said receiver input and said inverted signal;

d. threshold detector means for providing first and second detector signals wherein said first detector signal is representative of the occurrence of one or more signal parameters in said filtered receiver input signal and in said filtered inverted signal which reach predetermined values and wherein said second detector signal is representative of the absence of the occurrence thereof;

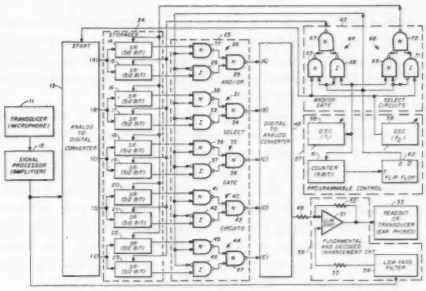
e. hysteresis means included with said threshold detector means for causing said threshold detector means to maintain said first detector or said second detector output once formed until the one or more parameters of said filtered receiver input signal and said filtered inverted signal reach predetermined values which are different from those causing the formation of said detector signals;

f. output circuit means selectively responsive to at least one of said first and second detector signals for reproducing an undistorted signal directly corresponding to the input signal supplied to said transmitter, said output circuit means including pulse duration restoring means for providing pulse durations in one or more of said first and second detector signals corresponding to those durations of the pulses in said receiver input signal and said inverted signal which produced said detector signals, said pulse duration restoring means including latch means responsive to the transition from said second to said first detector signal to produce said undistorted signal.

3,924,069
HELIUM SPEECH DECODER

Cleil A. Dildy, Jr., Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 388,713, Aug. 15, 1973. This application Oct. 15, 1974, Ser. No. 514,729The portion of the term of this patent subsequent to Jan. 28, 1992, has been disclaimed.
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SH **15 Claims**



1. A data signal decoder, comprising in combination:

means for receiving and transducing a predetermined data signal into an electrical analog signal that is proportional thereto;

means having a data signal input, a start signal input, and a plurality of outputs, with the data signal input thereof effectively connected to the output of said receiving and transducing means for converting said electrical analog signal into a digital word signal represented by a plurality of bits respectively available at the aforesaid plurality of outputs thereof in response to a predetermined start signal supplied to the start signal input thereof;

a plurality of pairs of shift registers, each pair of shift registers of which include an odd numbered shift register and an even numbered shift register, each shift register of which has a data signal input, a shift signal input, and a data signal output, with the odd and even numbered shift registers of each pair of shift registers of said plurality of pairs of shift registers having their data signal inputs interconnected and respectively connected to the plurality of outputs of said analog-to-digital signal converting means in such manner as to timely receive and store said plurality of bits therein in response to a predetermined pair of shift signals respectively supplied to the shift signal inputs thereof, with the shift signal inputs of said odd numbered shift registers being interconnected for simultaneous response to one of the aforesaid predetermined pair of shift signals, and with the shift signal inputs of said even numbered shift registers being interconnected for simultaneous response to the other of the aforesaid predetermined pair of shift signals;

a plurality of And/Or select gates, each of which has a pair of data signal inputs, a pair of interconnected gating control signal inputs, and a data signal output, with the pairs of data signal inputs of each And/Or select gate thereof respectively connected to the outputs of the odd and even numbered shift registers of each pair of shift registers of said plurality of pairs of shift registers for timely passing therethrough the bits stored in said odd and even numbered shift registers in response to a predetermined programmed gating control signal supplied to the interconnected gating control signal inputs thereof;

means having a plurality of inputs responsive to a digital word signal that contains the same number of bits as the number of inputs thereof respectively connected to the data signal outputs of said plurality of And/Or select gates for converting the digital word signal received therefrom into an electrical analog signal that is proportional thereto;

a read clock oscillator for producing a first clock signal having a predetermined first frequency at the output thereof;

a write clock oscillator for producing a second clock signal having a predetermined second frequency at the output thereof, with the output thereof connected to the start signal input of the aforesaid electrical analog signal to digital word signal converting means;

a counter connected to the output of said read clock oscillator;

a flip-flop having a toggle input, a Q output, and a Q output, with the toggle input thereof connected to the output of said counter, and with the Q output thereof connected to the interconnected gating inputs of the aforesaid plurality of And/Or select gates;

another And/Or select gate having a pair of data signal inputs, a pair of interconnected gating control signal inputs, and an output, with one of the data signal inputs thereof connected to the output of said write clock oscillator, with the other data signal input thereof connected to the output of said read clock oscillator, with the interconnected gating control signal inputs thereof connected to the Q output of said flip-flop, and with the output thereof connected to the interconnected shift signal inputs of the aforesaid odd numbered shift registers;

still another And/Or select gate having a pair of data signal inputs, a pair of interconnected gating control signal inputs, and an output, with one of the data signal control inputs thereof connected to the output of said read clock oscillator, with the other data signal input thereof connected to the output of said write clock oscillator, with the interconnected gating control signal inputs thereof connected to the Q output of said flip-flop, and with the output thereof connected to the interconnected shift signal inputs of the aforesaid even numbered shift registers; and

means effectively connected to the output of the aforesaid receiving and transducing means and to the output of said digital word signal to electrical analog signal converting means for adding substantially the electrical analog fundamental of the aforesaid predetermined data signal to the electrical analog signal from the output of the aforesaid digital word signal to electrical analog signal converting means.

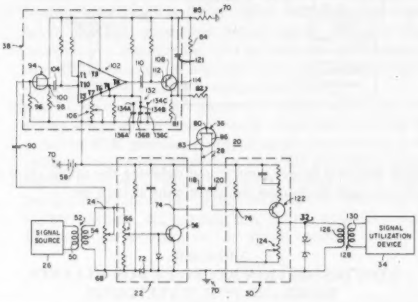
3,924,070
VOICE GATED AMPLIFIER

F. Harmon Seaver, Walworth, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Filed Mar. 16, 1970, Ser. No. 19,651
Int. Cl.² H03F 3/72
U.S. Cl. 179—1 VC **5 Claims**

1. A voice gated, multi-stage amplifier having an input terminal to receive input signals and a signal path coupling the successive stages of the amplifier, said amplifier comprising:

a normally nonconductive field effect transistor having a gate electrode, drain and source electrodes, and an interrupt circuit between said drain and source electrodes, said drain and source electrodes being coupled in series relation with the signal path so that said interrupt circuit normally interrupts the signal path and so that said interrupt circuit provides a variable impedance circuit between said drain and source electrodes.

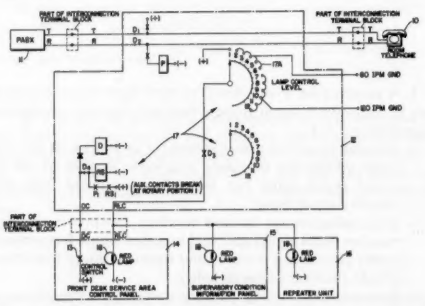


and a gating circuit coupling the gate electrode of said field effect transistor to the input terminal and rendering the field effect transistor conductive in response to an increase of the input signals above a predetermined amplitude so that said interrupt circuit does not interrupt the signal path.

3,924,071
AREA UNIT STATUS SYSTEM

Robert M. Pirnie, III, Montgomery, Ala., assignor to Communication Equipment and Contracting Company, Inc., Union Springs, Ala.

Continuation-in-part of Ser. No. 334,980, Feb. 23, 1973, Pat. No. 3,854,009. This application Oct. 16, 1973, Ser. No. 403,256
Int. Cl.² H04M 1/02
U.S. Cl. 179—2 A **2 Claims**



1. For use with a plurality of dial telephones serving a plurality of service area units, which telephones are connectible to and disconnectible from a PABX with at least one telephone being in each service area unit; an area unit status system comprising:

a. a service area control means comprising a switch and visual status indicating lamps for each of the service area units;

b. at least one remote panel with corresponding status indicating lamps;

c. dial responsive means connected for actuation by dial pulses from said telephones when the telephones are

disconnected from said PABX, and also actuated upon energization via said switch;

d. means for disconnecting the telephones from the PABX and energizing the dial responsive means;

e. said means for disconnecting being in circuit with and operated under control of said switch in a first position;

f. lamp operating means comprising a single level stepping switch connected between said lamps and sources of energy therefor and selectively responsive to energization of the dial responsive means to establish a first lamp indicating condition among said lamps, and selectively responsive to the dialing of a first digit to establish a second lamp indicating condition among said lamps, and selectively responsive to the dialing of a second digit to establish a third lamp indicating condition among said lamps; one of said conditions comprising flashing said lamps and a second of said conditions comprising winking said lamps at a rate detectably different from the flashing by human vision, and

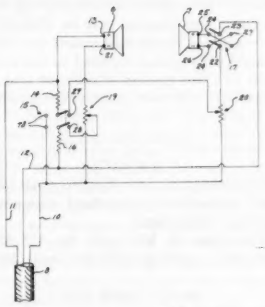
g. said means for disconnecting being operated by said switch in a second position to connect the telephones to said PABX and de-energize the dial responsive means.

3,924,072

HEADPHONE WITH CROSS FEEDING AMBIENCE CONTROL

Jacob C. Turner, and Douglas M. Elliott, both of Milwaukee, Wis., assignors to Koss Corporation, Milwaukee, Wis.

Filed July 10, 1974, Ser. No. 487,031
Int. Cl.[2] H04R *5/02*
U.S. Cl. 179—1 GP **3 Claims**



1. In a stereophonic headphone having a first audio transducer mounted in a first cup for positioning over one ear of a listener and having a pair of input terminals, a second audio transducer mounted in a second cup for positioning over the other ear of the listener and having a pair of input terminals, and cable means for coupling separate audio signals to each of said audio transducers, the improvement therein comprising:

a left channel lead in said cable means connected to one input terminal on said first audio transducer;

a right channel lead in said cable means connected to one input terminal on said second audio transducer;

first ambience resistor means mounted in one of said cups and connected between the other terminal on said first audio transducer and a ground lead in said cable means, said first ambience resistor means being operable to voltage divide an audio signal applied across said left channel lead and said ground lead with said first audio transducer;

a first coupling resistor mounted within one of said cups and connected to the right channel lead and coupled to said first ambience resistor means, said first coupling resistor being operable to couple a portion of said left channel signal generated across said first ambience resistor means to said one input terminal on said second audio transducer;

a second ambience resistor means mounted within one of said cups and connected between the other terminal on said second audio transducer and said ground lead, said second ambience resistor means being operable to voltage divide an audio signal applied across said right channel lead and said ground lead with said second audio transducer; and

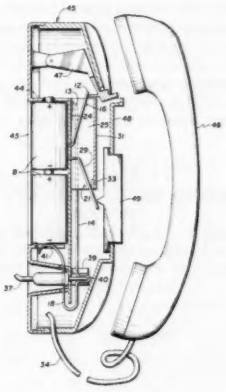
a second coupling resistor mounted within one of said cups and connected to the left channel lead and coupled to said second ambience resistor means, said second coupling resistor being operable to couple a portion of said right channel signal generated across said second ambience resistor means to said one input terminal on said first audio transducer.

3,924,073

HOME INTERCOM TELEPHONE SET

Horst Brandstatter, Vestner Str. 7, Zirndorf, Germany

Filed Sept. 26, 1974, Ser. No. 509,540
Int. Cl.[2] H04M *1/02, 1/08*
U.S. Cl. 179—1 H **6 Claims**



1. A telephone for use in an intercom system having a similar second telephone, the telephone comprising:

a prefabricated unit comprising a supporting plate having upright web plates and further comprising electrical connecting lines including dimensionally stable wire stirrups having bent-in ends extending through bores in said web plates to form a first, second and third pair of opposing contact pins;

a case enclosing said electrical connecting lines and detachably secured to said supporting plate;

a ringing unit electrically connected to said electrical connecting lines;

a receiver having assembled therein a speaking unit comprising a microphone and a loudspeaker electrically connected to said electrical connecting lines, wherein said receiver is removably held by said case;

means for connecting a current source to said electrical connecting lines;

means for electrically connecting the second telephone to said electrical connecting lines;

an electrically conductive selector device selectively movable into and out of contact with said first pair of opposing contact pins to establish or break electrical connection therebetween, wherein said selector device comprises a first spring element normally biased out of contact with said first pair of opposing contact pins;

a ringing key for energizing the ringing unit of the second telephone when said ringing key is actuated, wherein said ringing key cooperates with said selector device to move said selector device against its normal spring bias and into contact with said first pair of opposing contact pins when said ringing key is actuated;

an electrically conductive switching device selectively movable into contact with said second and third pairs of opposing contact pins to selectively establish electrical connection between contact pins of each said pair, wherein said switching device comprises a second spring element normally biased into contact with said third pair of opposing contact pins; and

a reversing key having a first position for connecting said ringing unit into an electrical circuit including the selector device of the second telephone and a second position for connecting said speaking unit into an electrical circuit including the speaking unit of the second telephone when its reversing key is in the second position and for connecting said selector device into an electrical circuit including the ringing unit of the second telephone when its reversing key is in its first position, wherein said switching device and said receiver cooperate with said reversing key to move said reversing key into its first position when said receiver is held by said case and establish electrical connection between said second pair of opposing contact pins by moving said switching device against its normal bias and to move said reversing key into its second position when said receiver is removed from said case and establish electrical connection between said third pair of opposing contact pins by permitting said switching device to move according to its normal bias.

3,924,074

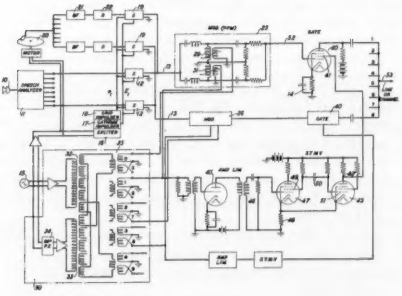
PULSE POSITION MODULATION KEY SIGNALING SYSTEM

Eugene Peterson, New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1945, Ser. No. 592,966

Int. Cl.² H04L *9/00*

U.S. Cl. 178—22 **6 Claims**



1. In a signaling system, a source of signal waves, a source of key waves, a transmission line or channel, means to allot periodic time intervals on said line to the transmission of signal indications thereover derived from said signals, means to produce signal indications for transmission and to encipher them comprising means to produce a pair of pulses of energy separated in time, and means to vary the absolute time positions of said pulses together under the conjoint control of said signal and key waves, one or the other of said two pulses always occurring within said time interval and the other always occurring outside said time interval, and means to transmit the former pulse over said line.

3,924,075

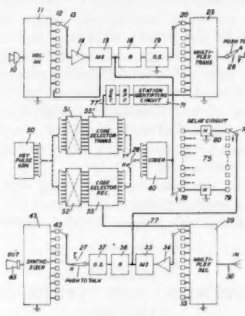
TWO-WAY PRIVACY SYSTEM TERMINAL WITH SINGLE KEY PULSE GENERATOR MEANS

Danforth K. Gannett, Mountain Lakes, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 20, 1947, Ser. No. 735,942

Int. Cl.² H04L *9/02*

U.S. Cl. 179—1.5 R **8 Claims**



7. In a privacy system, a terminal comprising a transmitter of enciphered message signals and a terminal-identifying signal, means for supplying coded key pulses to said transmitter for enciphering outgoing message signals, means for selectively generating a plurality of different terminal-identifying signals for transmission one at a time with enciphered message signals, so that for successive selected intervals the identifying signal assigned to the terminal may be changed, and means responsive to said last-mentioned means for correspondingly selectively coding the pulses supplied to the transmitter to a respective one of a like number of different codes upon selective generation of a different identifying signal for the terminal.

3,924,076

ELECTROMAGNETIC PHONO CARTRIDGE

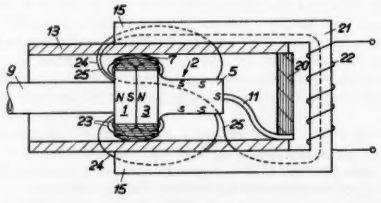
Roger Dubois, Colombier, Switzerland, assignor to Huber & Co., Hauterive, Switzerland

Filed Dec. 18, 1973, Ser. No. 425,852

Claims priority, application Switzerland, May 29, 1973, 7753/73

Int. Cl.² H04R *11/12*

U.S. Cl. 179—100.41 M **10 Claims**



1. An electromagnetic phono cartridge comprising:

a lamellar axially magnetized permanent magnet said permanent magnet having a flat side, an outer circumferential narrow side and an end face;

a non-magnetic cantilever provided with a stylus tip connected to said permanent magnet;

a ferromagnetic armature tube directly mounted on the end face of said permanent magnet, said armature extending coaxially from the permanent magnet to the cantilever in the opposite direction, and wherein said armature tube

includes a first segment connected to the end face of said permanent magnet, said first segment having transverse dimensions approximately equal to those of said permanent magnet;

flexible sleeve means for covering the entire circumference of the outer narrow side of said permanent magnet;

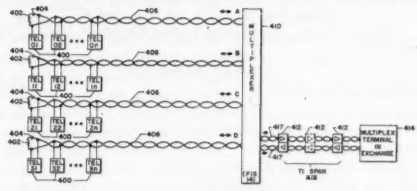
nonmagnetizable shell means having an inner surface and housing said permanent magnet, said armature and a portion of said cantilever adjacent said permanent magnet; said flexible sleeve means being in contact with said inner surface of said shell means at a plurality of points for supporting said permanent magnet, armature and cantilever; and

a pair of pole pieces substantially enclosing said shell means, said pole pieces including coils in the phono cartridge.

3,924,077
PULSE CODE MODULATION TIME DIVISION MULTIPLEX TELEPHONE SYSTEM

Thomas R. Blakeslee, 172 Otis Ave., Woodside, Calif. 94062

Filed July 5, 1973, Ser. No. 376,843
Int. Cl.² H04J *3/08*
U.S. Cl. 179—15 AL **24 Claims**



1. A time division multiplex telephone system comprising: terminal means for transmitting and receiving a plurality of telephonic signals from one end only of a single bidirectional wire pair in a repetitive time frame format having a plurality of sequential E time slots transmitted from said terminal means in one time interval and a corresponding plurality of M time slots received at said terminal means in a different time interval, each of said telephonic signals occupying a pair of E and M time slots; and a plurality of telephones connected across said wire pair in parallel to said terminal means, each of said telephones including logic circuitry means for conditioning said telephones to receive and transmit bidirectional telephonic signals in an assigned corresponding pair of E and M time slots, said terminal means including means for receiving M sample transmissions at times which are delayed by round trip delays existing between said terminal means and respective telephones.

3,924,078
APPARATUS FOR DISPLAYING AN EXTREME VALUE AMONG A SUCCESSION OF DIGITAL VALUES

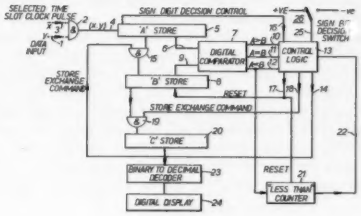
Christopher John Bussey, High Wycombe, England, assignor to The Post Office, London, England

Filed Apr. 10, 1974, Ser. No. 459,562
Claims priority, application United Kingdom, Apr. 19, 1973, 19143/73
Int. Cl.² H04J *3/14*
U.S. Cl. 179—15 BF **6 Claims**

1. A method of testing a pulse code modulation equipment in which a signal to be encoded is sampled at a fixed sampling frequency and the samples are encoded in digital form to produce a desired pulse code signal, the method including

a. applying as the signal to be encoded an oscillation of known steady amplitude and of frequency bearing no simple relationship to the sampling frequency of the equipment,

b. comparing the digitally encoded samples of the pulse code signals with a previously occurring maximum encoded sample and up-dating the maximum sample whenever it is exceeded by a subsequent sample, and

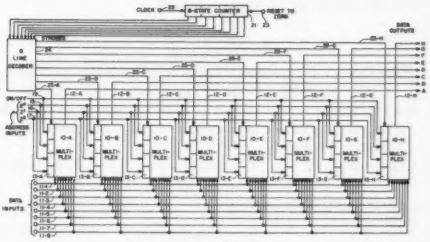


c. displaying the value of the maximum sample, thereby indicating the encoded value of the known amplitude.

3,924,079
LATCHING MULTIPLEXER CIRCUIT

Lane S. Garrett, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 429,965
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 A **8 Claims**



1. A system for selectively transferring data appearing on any one of N input terminals to any one of M output terminals, where N and M are positive integers, including in combination:

M decoding gate means each having an output coupled to one of said M output terminals and having N inputs coupled to said N input terminals, respectively;

M address memory means, each comprising a binary register having a predetermined number of output terminals capable of producing at least N different binary number output combinations, the output terminals of each of said address memory means coupled to a different one of said M decoding gate means for causing such decoding gate to interconnect a predetermined one of said N inputs thereof with the output thereof in accordance with the binary number appearing on the output terminals of said address memory means;

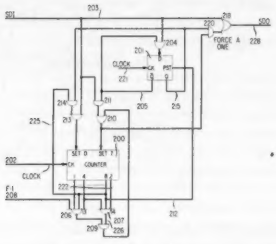
means for supplying a binary address input in common to all of said M address memory means;

ring counter circuit means having at least M output terminals each coupled with a different respective one of said M address memory means for enabling said address memory means sequentially to store in said binary register of each of said address memory means the binary address input supplied thereto only when said binary registers are enabled by an output from said ring counter circuit means.

3,924,080
ZERO SUPPRESSION IN PULSE TRANSMISSION SYSTEMS

James Lewis Caldwell, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 2, 1974, Ser. No. 528,728
Int. Cl.[2] H04J 3/06
U.S. Cl. 179—15 BS 9 Claims



2. A zero suppression circuit for serial pulse data comprising:

a pulse position counter,

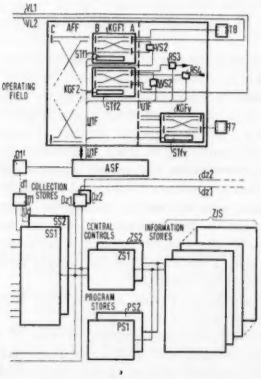
means for forcing a pulse into said serial pulse data to provide at least one pulse in each group of N or less pulse positions for at least one possible division of said pulse stream into such groups, and

means for delaying said pulse forcing means to the end of a group of 2N pulse positions whenever consistent with the above-stated forcing criteria.

3,924,081
CENTRALLY CONTROLLED TELECOMMUNICATION EXCHANGE CONNECTION ARRANGEMENT

Josef Rohrig; Justus Konig, and Gunther Seidel, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 196,929, Nov. 9, 1971, abandoned.
This application Jan. 2, 1974, Ser. No. 429,813
Claims priority, application Germany, Nov. 12, 1970, 2055745
Int. Cl.[2] H04Q 3/54
U.S. Cl. 179—18 EB 2 Claims



1. Apparatus for centrally controlled telecommunication exchange installations wherein groups are formed from a plurality of individual apparatuses, each said group being connected to the central control over an individual buffer memory, comprising:

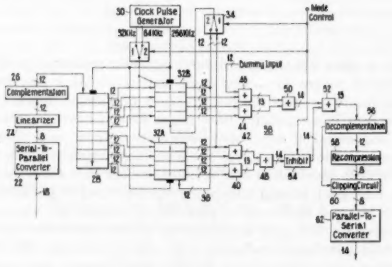
common circuit means connecting the individual apparatuses of a group to the said individual buffer memory associated with the group, said common circuit means including connection means for connecting each said individual apparatus separately to said common circuit means and thereby to said buffer memory, said individual apparatuses constituting a group being arranged with respect to the said buffer memory associated therewith as to be in sufficiently close spatial proximity thereto to facilitate direct communication therewith in a manner as to substantially avoid customary transmission line disturbances associated with line length and

individual and separate transmission line means connecting each said buffer memory to said central control for direct data communication therebetween, whereby each said individual transmission line means can be matched for optimal transmission characteristics.

3,924,082
CONFERENCE CIRCUITS FOR USE IN TELECOMMUNICATIONS SYSTEMS

Stephen Edward Oliver, Rugby, and Nicholas Richard Winch, Coventry, both of England, assignors to The General Electric Company Limited, London, England

Filed Feb. 4, 1974, Ser. No. 439,627
Claims priority, application United Kingdom, Feb. 5, 1973, 5575/73
Int. Cl.[2] H04M 3/56
U.S. Cl. 179—18 BC 6 Claims



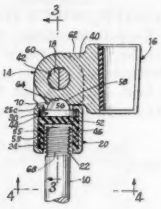
1. A conference circuit for use in a telecommunication system, said circuit comprising: a cyclic shift register having more than two stages each of which stages can hold a digital data word; means for clocking said shift register at a predetermined clock rate; means for writing digital data words from more than two input channels into respective stages of said shift register, at one point in each cycle of said register; digital adding means coupled to all but one of said stages of said register, for adding together the contents of the stages coupled thereto so as to produce a digital output word each time the shift register is clocked, said digital output word thus being a conference word for transmission to a conferee associated with the data word temporarily occupying said one of said stages at the particular said time, which data word was not included in the adding process at the particular said time; and a plurality of output channels for respective conferees, and corresponding to the successive states of said shift register in a said cycle, each said output channel receiving a respective said digital output word in the corresponding state of said shift register, whereby each output channel receives the sum of the data words from all but a corresponding one of the input channels.

3,924,083

QUICK MOUNT ISOLATOR STAND ADAPTOR

Lee Hagey, Buchanan, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Oct. 23, 1974, Ser. No. 517,079
Int. Cl.[2] H04M 1/14
U.S. Cl. 179—149 10 Claims



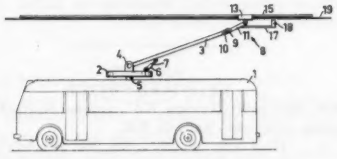
1. An adaptor for removably mounting a hand held type microphone on the end of a shaft comprising a housing having a first portion and a second portion disposed adjacent thereto, said first portion having a cavity therein with a wall between the first and second portion of the housing and an orifice in the wall between the first and the second portion of the housing, said first portion of the housing also having an opening in the wall thereof communicating with the cavity and adapted to receive the end of the shaft, a cam, means operatively associated with the second portion of the housing for rotatably mounting the cam directly confronting the orifice in the wall of the first portion of the housing, a plunger disposed within the cavity of the first portion of the housing and having a protuberance extending outwardly from the cavity into slidable abutment with the cam, said cam having a first segment of greater diameter and a second segment of lesser diameter in slidable engagement with the protrusion on the plunger, a block of compliant material disposed within the cavity between the plunger and the opening, said block having a recess aligned with and confronting the opening adapted to receive the end of the shaft, a lever mounted on the cam for positioning the cam with the first or second segment thereof in abutment with the plunger, said block being compressed by the plunger when the first segment of the cam engages the plunger and being released from compression when the second segment of the cam engages the plunger, and means mounted on the housing for mounting a hand held type microphone to the housing.

3,924,084

ARRANGEMENT FOR POWER TRANSMISSION FROM A STATIONARY ELECTRIC CONDUCTOR TO A VEHICLE

Olov Halvar Lindfors, Goteborg, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Dec. 4, 1974, Ser. No. 529,588
Claims priority, application Sweden, Dec. 4, 1973, 7316361
Int. Cl.[2] B60L 5/00
U.S. Cl. 191—45 6 Claims



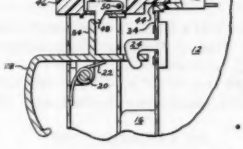
1. An arrangement for the transmission of electric power from a stationary electric conductor to a vehicle, whereby the vehicle, when driven along a contact wire, is supplied with current from the same by means of a current collector which is connected to the vehicle and lies in contact with the contact wire, said current collector being movable in a restricted manner in the transverse direction of the vehicle and to and from the contact wire, said vehicle being provided with alternative means of driving the vehicle without current supply from the contact wire, characterized in that a signal transmitter extends along the longitudinal direction of the contact wire and that the vehicle is provided with a signal receiver for receiving signals emitted from the signal transmitter, positioning means for moving the current collector at least in the transverse direction of the vehicle and a control device for controlling, in dependance of signals received by the signal receiver, the positioning means so that the current collector can, from a position in which it is not in contact with the contact wire, be brought into contact with said contact wire.

3,924,085

SAFETY-START DEVICE AND CIRCUIT CONTROLLER FOR DOMESTIC APPLIANCE

Aidan M. Stone, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 18, 1974, Ser. No. 451,973
Int. Cl.[2] H01H 3/16, 27/00
U.S. Cl. 200—61.62 6 Claims



1. In an appliance having a body including an access opening and a closure therefor, a safety-start device comprising:

a switch having an opening and supported within the appliance body for preventing operation of the appliance unless the switch is intentionally actuated;

an actuating member supported on the closure and free to move back and forth normal to the closure and relative thereto, said actuating member being in co-axial alignment with an inserted into the switch opening when the closure is in its closed position such that auxiliary movement of the actuating member axially inward toward the switch and relative to the closure actuates the switch to allow operation of the appliance and completely removable from the switch when the closure is in its open position; and

means in the safety-start device for latching the actuating member with the switch and retaining it therein when in its axially inward position thereby maintaining the switch in its actuated state until the closure is opened whereupon the actuating member is moved relative to the closure and separated from the switch and the switch unactuated.

3,924,086

PRESSURE RESPONSIVE MAGNETIC SWITCH

Rolf H. Ochsner, Milford, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 27, 1974, Ser. No. 455,451
Int. Cl.[2] H01H 35/38
U.S. Cl. 200—82 R 12 Claims

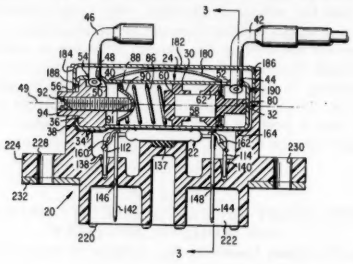
1. A pressure responsive magnetic switch comprising

a non-magnetic housing having a plurality of wall portions forming a cavity;

a magnetically operated switch contact unit;

a plurality of first projections extending into the cavity from the wall portions and supporting the switch contact unit in a first location in the cavity;

a switch operator including a tubular non-magnetic cylinder, a permanent-magnetic piston slidable in the cylinder,



and first and second conduits communicating with respective ends of the tubular cylinder;

a plurality of second projections extending into the cavity and retaining the tubular cylinder in a second location in the cavity adjacent the switch contact unit;

terminal means mounted in the housing and extending outside the housing from the cavity; and

means in the cavity electrically connecting the switch contact unit to the terminal means.

3,924,087

VACUUM CIRCUIT INTERRUPTOR

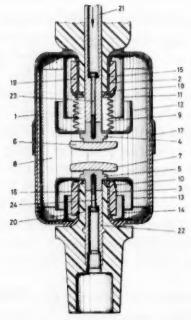
Jan Christiaan Clason, Hengelo, Netherlands, assignor to Hazemeijer B.V., Netherlands

Filed Oct. 1, 1973, Ser. No. 402,129

Claims priority, application Netherlands, Oct. 2, 1972, 72/3302

Int. Cl.[2] H01H *33/66*

U.S. Cl. 200—144 B **2 Claims**



1. A vacuum circuit interruptor comprising: a cylindrical metallic envelope; two cylindrical insulators secured to said envelope on both ends thereof in a vacuum tight fashion, said two insulators from the ends which are secured to said envelope being directed towards one another and disposed within said envelope; contact rods supported by free ends of said cylindrical insulators in a vacuum tight fashion; two contact members secured to said contact rods, said contact members being arranged in said envelope; one of said contact members being movable and the associated said contact rod being secured to the associated said insulator by a bellows; the outer cylindrical surface of each said insulator being provided with a sleeve of elastic insulating material, a stub of non-elastic insulating material, pressed into said sleeve, in such a manner as to be free of voids in the interface between said insulator and the associated said sleeve and in the interface between said sleeve and said insulating stub, and each stub having an axial passage, in which the respective contact rod of the respective contact member is disposed.

3,924,088

GAS-BLAST POWER SWITCH FOR HIGH VOLTAGE

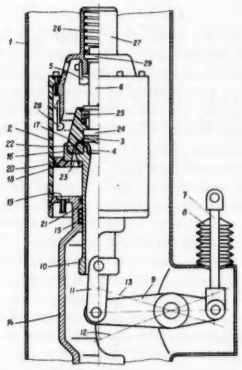
Hans Heutschi, Kappel near Olten, Switzerland, and Peter Krebs, Harleysville, Pa., assignors to Sprecher & Schuch AG, Aarau, Switzerland

Filed Sept. 18, 1874, Ser. No. 507,254

Claims priority, application Switzerland, Oct. 11, 1973, 14467/73

Int. Cl.[2] H01H *33/88*

U.S. Cl. 200—148 A **6 Claims**



1. A gas-blast power switch for high voltage comprising a gas filled housing, a power interrupter and disconnector switch connected in series and arranged in said housing, a pump device equipped with a pump cylinder and a pump piston and positively connected with a switch drive, said pump device during cut-off conveying gas into the power interrupter and during cut-on sucking-up gas, the improvement comprising a wall for partitioning the housing into two compartments, the power interrupter being arranged in one compartment and the disconnecting switch in the other compartment, said power interrupter comprising a ring contact pair surrounded by a ring gap nozzle arranged in said wall, said ring contact pair receiving in the open state of its pair of contacts at least 2.5-fold phase voltage of a high voltage network, said ring gap nozzle having a gap bounded at least at one side by electrically insulating material, said disconnecting switch being provided with contacts and having disconnecting path which is designed at least for the test voltage of the power switch, the contacts of the power interrupter during cut-off separating between 20 and 50 percent of the pump piston stroke and the contacts of the disconnecting switch separating no earlier than at 80 percent of the pump piston stroke.

3,924,089

KEYBOARD SWITCH

Lynn W. Abernethy, Raleigh, N.C., assignor to Stackpole Components Company, Raleigh, N.C.

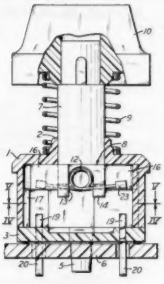
Filed Aug. 28, 1974, Ser. No. 501,141

Int. Cl.[2] H01H *13/52, 1/02, 1/24, 1/32*

U.S. Cl. 200—159 R **5 Claims**

1. A keyboard switch comprising a case having a top with an opening therethrough, a plunger having a foot in the case

and a stem extending upwardly through said opening and above the case, a spring normally holding the plunger in its upper position with its foot adjacent the top of the case, a bridging contact member in the case carried by the plunger, said contact member being formed from a spring wire coil attached to said foot and having free end portions extending away from opposite sides of the foot, electrically conductive



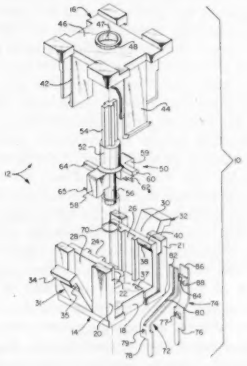
elastic members rigidly mounted on the ends of said free portions, a pair of stationary electric contacts mounted in the case beneath said movable contacts and normally spaced therefrom, said movable contacts being engageable with the stationary contacts when the plunger is depressed, and terminals connected with the stationary contacts and extending out of the case.

3,924,090

SWITCH ASSEMBLY WITH RECIPROCATING CAMS

Stanley K. Chao, Lexington, and Albert Eng, Chestnut Hill, both of Mass., assignors to Data Electronics Corporation, Burlington, Mass.

Filed Sept. 16, 1974, Ser. No. 506,400
Int. Cl.[2] H01H *13/52, 3/42*
U.S. Cl. 200—159 A **8 Claims**



1. A switch assembly comprising in combination:

first and second interlockable housing members which when interlocked form a substantially hollow enclosure having an aperture at one end thereof, and a pair of parallel keyways disposed along the interior walls thereof;

a switch plunger having a portion thereof extending through said aperture, and being mounted for substantially unidirectional motion along said keyways;

spring means for resiliently biasing said plunger outwardly from said aperture to a first position;

a first electrically conductive contact strip mounted on one of said housing members with a portion thereof extending through said one of said housing members, and being supported within said enclosure in a substantially stationary position;

a second electrically conductive flexible strip having a bifurcated portion mounted on one of said housing members so as to extend therethrough and being spaced from said first strip when said plunger is in said first position;

said plunger including first and second cam portions, said first cam portion being disposed between said conductive strips so as to positively maintain said two strips in spaced apart relation when said plunger is in said first position, and being moved out of contact with said second strip when said plunger is moved against the bias of said spring to a second position;

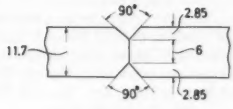
said second cam portion being disposed so that when said plunger is moved toward said second position said second cam portion engages the bifurcations of said second strip and forces the latter into electrical contact with said first strip.

3,924,091

WELDING METHOD AND MATERIALS

Haruyoshi Suzuki, Seki; Thuyoshi Takino, Yachio; Naomichi Mori, Machida; Isao Sugioka, Funabashi; Osamu Matsuda, Narashino; Shozo Sekino, Kitakyushu, and Hiroyuki Honma, Utsunomiya, all of Japan, assignors to Nippon Steel Corporation and Nippon Steel Welding Products Engineering Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 169,915, Aug. 9, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,329
Claims priority, application Japan, Sept. 29, 1970, 45-84613; Aug. 14, 1970, 45-75575; Dec. 10, 1970, 45-109847
Int. Cl. B23K *9/18*
U.S. Cl. 219—73 **3 Claims**



1. In a method of submerged arc welding to obtain a welded metal with high toughness, the improvement which comprises using in combination:

a. a submerged arc flux having a nearly neutral composition and having a basicity b as expressed by formula (1) herein in the range from about 0.90 to 1.30, wherein

$$b = \frac{CaO+MgO+BaO+Na_2O+K_2O+Li_2O+CaF_2+\frac{1}{2}(MgO+FeO)}{SiO+\frac{1}{2}(Al_2O_3+TiO_2+ZrO_2)}$$

the amounts of the compounds being expressed in weight per cent based on the weight of the flux; and

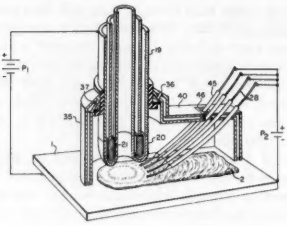
b. a wire composed of a hollow-core mild steel sheath, said core being packed with a powdered mixture of about 0.04 to 1.0% by weight titanium, about 0.002 to 0.05% by weight boron, and about 4 to 25% by weight of a fluoride compound selected from the group consisting of CaF_2, NaF_2, KF, LiF, M_gF_2, MnF_2, and combinations thereof, all weights being based on the weight of the wire and the balance of the weight of the wire being the steel sheath.

3,924,092

METHOD AND APPARATUS FOR CLADDING A BASE METAL

Gerald G. Lessmann, Pittsburgh, and Albert R. Vaia, Delmont, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 14, 1974, Ser. No. 479,388
Int. Cl.[2] B23K 9/04
U.S. Cl. 219—76 4 Claims



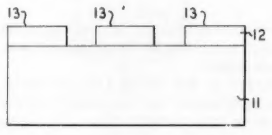
1. Apparatus for overlaying a base metal with overlapping bands of cladding material which are integrally bonded thereto, said apparatus comprising an electrode having a non-consumable tip; cooling means and means for generating a magnetic field disposed within said non-consumable tip; means for positioning said electrode with respect to said base metal to produce a gap between the base metal and the tip of the electrode; means for producing an arc between the tip and said base metal to form a molten surface adjacent said tip; means for supplying cladding metal to the vicinity of said arc and said molten surface at a controlled rate; means for providing a blanket of a suitable gas covering said pool and arc; and means for relatively moving said electrode with respect to said metal in such a manner as to produce overlapping bands of cladding metal which overlays the base metal and are integrally bonded thereto.

3,924,093

PATTERN DELINEATION METHOD AND PRODUCT SO PRODUCED

Martin Feldman, Murray Hill; Denis Lawrence Rousseau; William Robert Sinclair, both of Summit, and Walter Werner Weick, Somerville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1973, Ser. No. 358,730
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 LM 6 Claims



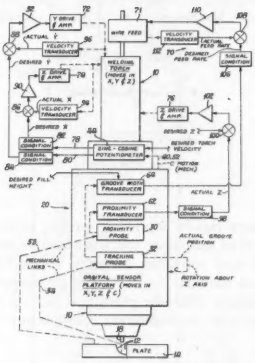
1. Procedure for the fabrication of a substrate-supported pattern-delineated film, in which delineation comprises selectively removing film thereby resulting in exposed substrate, comprising irradiating portions of said film with electromagnetic radiation to remove film within said portions by volatilization thereby baring underlying substrate, characterized in that the said film comprises oxidized iron with said film being sufficiently soluble such that a film thickness of 10,000 Angstrom units is removed by dissolution in an aqueous solution of 6N HCl (6 normal HCl) in one hour at room temperature—e.g., about 20°C)—in which the said electromagnetic radiation is the coherent output of a laser and in which the laser output is pulsed with pulse duration of a maximum of approximately 1 microsecond.

3,924,094

WELDING CONTROL ARRANGEMENT WITH ORBITAL TORCH-MOUNTED TRANSDUCING ASSEMBLY

Howard A. Hansen, Mossville, both of Ill.; Clyde E. Fulton, deceased, late of Tazewell, Ill.; by Minnie L. Fulton, heir, Tazewell, Ill., and by Brenda G. McCann, heir, Boise, Idaho, assignors to John W. Crayton, Washington and Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 15, 1973, Ser. No. 415,939
Int. Cl.[2] B23K 9/10
U.S. Cl. 219—125 PL 7 Claims



1. Apparatus for welding fixed workpiece means along a groove defined thereby comprising: a mounting body movable along any variable path; welding means connected to the mounting body and generally movable therewith; sensing means associated with the mounting body and generally movable therewith; the sensing means having a portion which may extend into and contact a portion of the groove; the welding means being positioned adjacent the sensing means and positionable adjacent the groove; means for providing movement of the mounting body in any direction to enable the mounting body to be moved thereby along any variable path; the sensing means, upon actuation of the means for providing movement of the mounting body, being movable generally along the groove; and means operatively connecting the sensing means and means for providing movement of the mounting body so that the welding means are movable generally along the groove in response to movement of the sensing means along the groove, so that weld material may be deposited in said groove in a continuous manner, and further comprising means associated with the sensing means for sensing the width of the groove as said sensing means follows the groove, and means operatively connecting the means associated with the sensing means and the welding means for increasing and decreasing the amount of weld material deposited in said groove, in proportion to the sensed increase and decrease in width of said groove, wherein the sensing means comprise a first sensing member having an extended portion thereof which may extend into and contact a portion of the groove, and a second sensing means positioned adjacent the first sensing member and having an extended portion thereof, which may contact the workpiece means adjacent said groove, wherein the welding means comprise an elongated welding electrode, and further comprising a support member pivotally associated with the mounting body so as to be pivotable relative thereto about the longitudinal axis of the welding electrode, and first and second lever arms pivotally fixed to the support member so as to be pivotable about a common axis transverse of the pivoting axis of the support member, the first and second

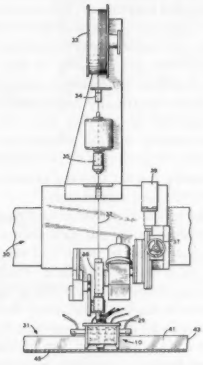
sensing members being fixed to the first and second lever arm respectively.

3,924,095

NARROW-GROOVE WELDING

Matthew J. Lucas, Jr., Fairfield, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 29, 1974, Ser. No. 474,478
Int. Cl.² B23K *9/12*
U.S. Cl. 219—125 R **9 Claims**



1. In narrow groove welding the combination comprising a work piece having a narrow groove therein with substantially parallel walls and a groove width substantially less than the depth thereof, an electric welding machine positioned exteriorly of the work piece and having a welding head projecting into the groove, means for positioning the welding head in a direction parallel to the depth of the groove, means for controlled relative movement of the work piece and the electric welding machine parallel to the narrow groove, means for feeding a consumable electrode wire through the welding head into the groove,, means for applying electric power through the consumable electrode wire to form an arc between the end of the wire and the work piece to weld join walls of the groove whereby the weld metal fuses both sides of the groove equally in a single pass, control means for regulating the rate of electrode wire feed to the arc, means for maintaining the tip of the electrode wire centered in the groove by transverse movement of the welding head relative to the walls of the groove, means for passing a protecting gas through the welding head to surround the welding arc in the groove, a shield loosely enclosing the welding head and resting on the surface of the work piece, and means for passing a stream of protective gas through the shield to flood the upper portion of the gap in the work piece.

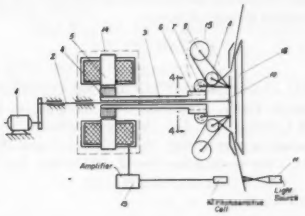
3,924,096

DEVICE FOR AUTOMATICALLY MAINTAINING A ROTARY ELECTRODE COMPOSED OF SINGLE WIRES OF A PREDETERMINED DIAMETER

Nadejda Stefanova Yanakieva, and Dragomirov Papazov, both of Sofia, Bulgaria, assignors to DSO "E L P R O M", Sofia, Bulgaria

Filed Mar. 25, 1974, Ser. No. 454,662
Claims priority, application Burma, Mar. 23, 1973, 23073
Int. Cl.² B23K *9/04*
U.S. Cl. 219—130 **6 Claims**

1. In a mechanism for creating and maintaining a composite rotating electrode, said electrode being formed of a plurality of single wires which emerge from a rotating depositing head mounted upon a driven shaft, the improvement which comprises a holder mounted upon said shaft coaxial thereof adjacent the depositing head of the electrode, a plurality of systems each carrying a supply of individual electrode wires on the holder, each system including means for feeding the wires thereof outwardly mounted upon the holder in equally angularly spaced relationship about the common axis of the shaft and the holder, each of said systems comprising a drum means adapted to carry, a coil of electrode forming wire thereon, a pair of pinch rolls for selectively feeding such wire from the



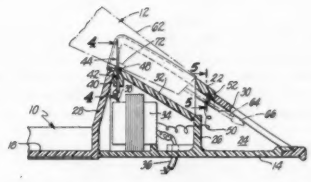
drum, a sleeve mounted telescopically about the shaft coaxial thereof, said sleeve having a worm on the end thereof adjacent the electrode head, a worm affixed to one of the pinch rolls of each of said systems and constantly in mesh with said worm, the worm end and worm gears being so constructed and arranged that the worm gear can be driven by the worm but the worm cannot be driven by the worm gear, whereby the sleeve normally rotates in the same direction and at the same speed as the shaft and the holder, and means for selectively changing the speed of rotation of the sleeve with respect to the shaft so that the pinch rolls feed individual wires outwardly of the electrode head.

3,924,097

STAND FOR CHARGING AN ELECTRIC TOOL AND THE COMBINATION OF THIS STAND WITH SUCH A TOOL

Alvis R. Knowles, Carson, and Harold S. Foster, Huntington Beach, both of Calif., assignors to Eldon Industries, Inc., Hawthorne, Calif.

Filed Dec. 17, 1973, Ser. No. 425,240
Int. Cl.² H05B *1/00;* **H01M** *10/46*
U.S. Cl. 219—242 **9 Claims**



1. In a stand for supporting an electric tool having a contact member on the upper part thereof and a contact member on the lower part thereof, said tool including electrical utilization means connected to said contact members, and for supplying electricity to contact members on said tool the improvement which comprises:

first and second spaced electrical contact elements located on said stand, said contact elements being spaced apart, said first contact element facing upwardly, said second contact element facing downwardly, so that when said tool is supported on said stand said contact member on the lower part of said tool engages said first electrical contact element and so that said contact member on the upper part of said tool engages said contact element, and

cradle means on said stand for regulating the position of said tool on said stand and so positioned with respect to said contact elements that said tool can only be supported on said stand with said contact elements so engaged with said contact members so that a portion of said tool projects outwardly of said cradle means, away from the side of said first contact element remote from said second contact element, said portion being sufficiently heavy and said contact members being so positioned relative to the center of gravity of said tool so that the contact members of said tool are held in engagement with said contact elements by the force of gravity, and

means for connecting said contact elements on said stand to an external source of power.

3,924,098

HEATING ELEMENT, METHOD AND COMPOSITION

Stanley Austin Dunn, Madison, Wis., assignor to Bjorksten Research Laboratories, Inc., Madison, Wis.

Continuation-in-part of Ser. No. 242,436, April 10, 1972, abandoned. This application Dec. 3, 1973, Ser. No. 421,073

Int. Cl.[2] F24H *9/02*

U.S. Cl. 219—345 **4 Claims**

1. A method of making an electrical heating element which comprises the combination of the steps of:

providing a tailings mud comprising by weight on a dry basis 40 to 70 percent of silica, 10 to 20 percent of alumina and 10 to 20 percent of calcia, and

mixing said tailings mud with from 4 to 30 percent by volume of particles selected from iron and steel,

forming said mixture into a pre-selected shape,

firing said pre-selected shape at from about 940° C. to about 1,200° C. to cause said mixture to coalesce,

cooling and resultant article,

abrading portions of the article to which electrodes are to be attached, and

attaching electrodes to said abraded areas to provide said electrical heating element.

3,924,099

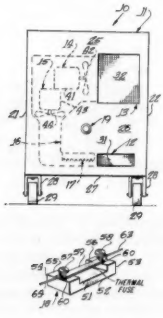
FORCED CIRCULATION ELECTRIC HEATER

William W. Housel, 2423 Brady St., Davenport, Iowa 52803

Filed Nov. 4, 1974, Ser. No. 520,419

Int. Cl.[2] H05B *1/00*; **F24H** *3/04*; **H01H** *37/76*

U.S. Cl. 219—371 **1 Claim**



1. A forced circulation electric heater comprising, in combination:

a housing having opposed side wall surfaces, opposed front and back wall surfaces, a top surface, and a horizontal flat bottom surface;

wheels mounted on said bottom surface for ease of transportation of said housing between locations of usage;

an inlet port disposed in said front surface closely adjacent the bottom edge thereof;

an outlet port disposed in said front surface at the top portion thereof;

an airflow passageway disposed interiorly of said housing and interconnecting said inlet port and said outlet port;

a first electric motor mounted in said passageway and having a motor shaft projecting horizontally outwardly therefrom in the direction of said outlet port and having a fan blade mounted on said shaft for rotation therewith in said passageway;

a second electric motor separate from said first motor and identical to said first motor and mounted in said passageway adjacent said first motor, the second motor having its motor shaft disposed along a vertical axis normal to said shaft of said first motor and projecting vertically downwardly therefrom and having a fan blade mounted thereon for rotation therewith in said passageway;

a pair of identical electrically energized heating coils electrically connected in parallel and mounted in spaced tandem relationship in said passageway downstream of said inlet port and upstream of said second motor and fan blade for heating the air flowing in said passageway from said inlet port to said outlet port;

a U-shaped fuse block disposed in said passageway intermediate said heating coils and said second motor, the fuse block having a bight portion and upright leg portions terminating in a flat top surface, each flat top surface having a threaded aperture extending vertically thereinto; a terminal screw having a threaded shank adapted to be threadedly received in each associated aperture;

a heat sensitive fuse link of a flat elongated rectangular configuration having apertures in opposite ends thereof adapted to be received beneath said terminal screws, said fuse link spanning said bight portion between said leg portions of said fuse block and rest on said flat top surfaces of said leg portions; and said fuse link being electrically connected in series with said heating coils and being selected to melt at a predetermined temperature within said passageway to break the electrical circuit between said terminal screws and de-energize said electrical heating coils to which said fuse link is electrically series connected; and

means for selectively connecting the heating coils and first and second motors to a source of electric power.

3,924,100

MOBILE FOOD SERVING SYSTEM

Anthony C. Mack, 13 Hillview Road, North Reading, Mass. 01864, and George K. Shumrak, 17 Fox Hill Drive, Natick, Mass. 01760

Filed May 9, 1974, Ser. No. 468,404

Int. Cl.[2] F27D *11/02*

U.S. Cl. 219—386 **23 Claims**

1. A mobile food serving system for maintaining food at a desirable serving temperature, said system comprising

a mobile cart having at least one tray supporting rack,

a self-contained electrical energy source carried by and movable with the cart,

a tray removably supported on the rack and having a supporting surface for food containers,

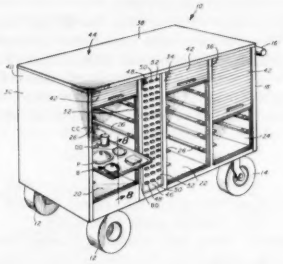
at least one localized contact heat transfer device in said surface with a substantial portion of the surface free of such devices,

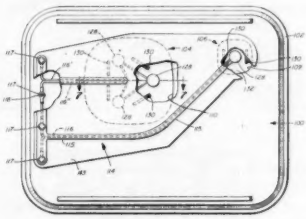
said tray carrying electrical contacts,

each localized heat transfer device comprising an electrical heater in thermal contact with a localized surface area of the tray for good heat transfer thereto,

each tray heat transfer device being electrically insulated and thermally insulated from other portions of said tray so that food can be maintained heated at said localized surface area while other areas of said tray surface can carry food without heating said last-mentioned food,

electrical connecting means including mating electrical contacts on said rack and a switch for supplying energy from the source on the cart to the heat transfer device on the tray surface through said tray contacts to energize said device when the tray is on the rack on the cart,





and a food container arranged in direct contact heat exchange relationship with the localized heat transfer device so as to transmit heat between the device and the food contained therein.

3,924,101

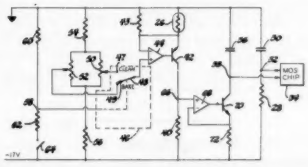
OVEN TEMPERATURE SENSING CIRCUITRY

Dale A. Beard, New Carlisle, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,585

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—490 **3 Claims**



1. A temperature sensing circuit for an oven operable in either a BAKE or CLEAN mode, said circuit supplying an input to an MOS integrated circuit and comprising temperature sensitive resistor means, first and second potentiometer means for establishing first and second calibration voltages, first switch means having a first position when said oven is in said BAKE mode and a second position when said oven is in said CLEAN mode, means responsive to the position of said first switch means for applying said first calibration voltage across said temperature sensitive resistor means when said first switch means is in said first position and for applying said second calibration voltage across said temperature sensitive resistor means when said first switch means is in said second position, current-to-voltage converter means for developing a voltage proportional to the current flowing in said temperature sensitive resistor means, a capacitor, means for supplying a charging current to said capacitor proportional to the voltage developed by said converter means, means connecting said capacitor with said MOS integrated circuit to provide a discharge path for said capacitor.

3,924,102

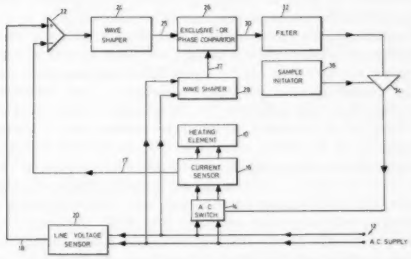
APPARATUS FOR CONTROLLING TEMPERATURE

Nicolaas W. Hanekom, Unic, Bosman St., Paarl, Cape Province, South Africa

Filed May 22, 1974, Ser. No. 472,122

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—497 **2 Claims**



1. Apparatus for controlling the temperature of an electrical heating element comprising means to connect the full voltage of an alternating electric power source to the heating element, means to derive a first voltage signal proportional to the current being drawn by the heating element, means to derive a second voltage signal proportional to the desired temperature of the heating element, means to compare the two voltage signals, means to disconnect the heating element from the power source when the magnitude of the first voltage signal is less than that of the second voltage signal, sampling means for then briefly connecting the full voltage of the power source to the heating element at periodic intervals for sampling purposes, and means to reconnect the full voltage of the power source to the heating element when the magnitude of the first voltage signal is greater than that of the second voltage signal.

3,924,103

ELECTRICALLY HEATED ALIGNMENT PAD

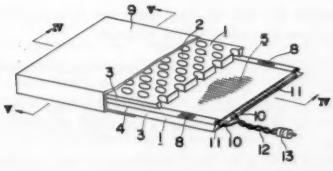
Haruhisa Furuishi, Suita; Yoshihiro Murata, Katano; Hidenori Suzaki, Hirakata; Misao Sumoto, and Hiroshi Imanaka, both of Otsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Toyo Boseki Kabushiki Kaisha, Japan

Filed Oct. 1, 1974, Ser. No. 511,471

Claims priority, application Japan, Oct. 1, 1973, 48-110851

Int. Cl.[2] H05B *3/34*

U.S. Cl. 219—528 **16 Claims**



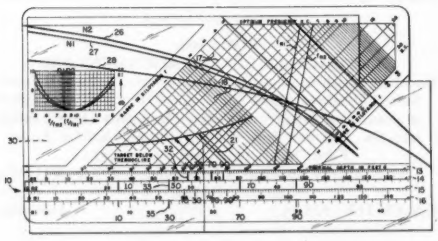
1. An electrically heated alignment pad which comprises at least one flat plate member of thermoplastic resin, and at least

one thin flat electric heater having one surface laying against substantially the whole flat surface of said plate member for heating said plate member to soften said plate member, the other surface of said heater adapted to be held in electrically insulated relationship to the surface supporting it, and to an article to be aligned, said plate member and heater having a structure the thickness of which is reduced when an external compressive force is applied thereto when said plate member is in the heat softened condition, whereby an object through which the compressive force is applied can be moved by the reduction of thickness of the alignment pad for adjusting the position thereof in the direction of the force being applied to the alignment pad; said plate member having a plurality of apertures therein into which portions of said plate member around said apertures flow laterally upon the softening of said plate member when said compressive force is applied thereto; said thermoplastic resin being a block copolymer which comprises a crystalline polyester segment in an amount of 99 to 15 wt% relative to the total weight of said block copolymer and a non-crystalline polymer segment in an amount of 1 to 85 wt% relative to the total weight of said block copolymer, said crystalline polyester segment being a polyester having a melting point not less than 150° C., and being selected from the group consisting of a polyester, polylactone and aromatic polyesterether, said polyester having an acidic component in the form of an aromatic dicarboxylic residue and a glycol component in the form of at least one compound selected from the group consisting of an aliphatic diol residue having 3 to 10 carbon atoms, an aromatic diol residue and an alicyclic diol residue, said non-crystalline polymer segment having a melting or softening point not more than 80°C. in itself and a molecular weight of not less than 400, said block copolymer having a minimum fluidizing temperature of from 130° to 220°C., a brittle point temperature of below −40°C., a compressive stress of from 5 to 350 kg/cm² at 5% deformation thereof, a compressive modulus of from 300 to 7,000 kg/cm², an impact strength of not less than 10 kg.cm/cm and a D-type Shore hardness of not less than 20.

3,924,104
NOISE AND REVERBERATION SONAR RANGE COMPUTER

Daniel Barron, 9326 Edmonston Road, Greenbelt, Md. 20770

Filed June 18, 1971, Ser. No. 154,616
Int. Cl.² G06C *3/00*
U.S. Cl. 235—61 B **4 Claims**



1. A device for determining noise and reverberation that limits sonar performance, which includes,

a base,

a plurality of rows of different scale values extending in parallel across the bottom of said base,

said base including thereon a portion of a logarithmic scale extending across said base at 45° angle above said scale values,

said logarithmic scale lines extending to the right and upwardly representing depth in feet,

said depth values indicated along the bottom of said logarithmic scale,

said logarithmic scale lines extending upwardly and to the left representing range values in kiloyards,

said range values aligned along the sides of said logarithmic scale,

a cursor positioned over said base for linear movement relative to said base,

said cursor including thereon three curved lines and a plurality of vertical parallel lines,

said vertical lines relating said curved lines to depth and range in accordance with probability of detection,

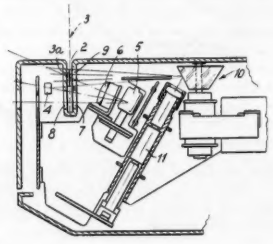
said vertical lines aligning with different rows of said plurality of rows of different scale values on said base, and

a single probability line on said cursor that extends across the total number of rows of said plurality of rows of different scale values on said base.

3,924,105
DEVICE FOR OPTICALLY READING CODED IDENTITY CARDS AND THE LIKE

Teresio Gassino, Ivrea, and Gianni Colombo, Sesto Calende, both of Italy, assignors to Tesalon Anstalt, Vaduz, Liechtenstein

Filed May 17, 1974, Ser. No. 471,078
Claims priority, application Switzerland, May 18, 1973, 7099/73
Int. Cl.² G06K *7/10, 9/13*
U.S. Cl. 235—61.11 E **3 Claims**



1. A device for optically reading coded identity cards and the like, comprising a slot into which an identity card can be inserted sideways, an element for detecting the presence of said identity card in said slot, a window in said slot arranged to face at least the coded zone of said identity card, a light source for illuminating said coded zone, a rotating mirror arranged to read said zone, a photodiode for collecting the images fed to it by said rotating mirror and to emit a signal which represents said images in a seriliazed configuration, and a unit for visualizing said signal, wherein said mirror is a pyramidal mirror having lateral faces arranged differently inclined to the axis of rotation of said pyramidal mirror so as to make readings of coded zones disposed at different levels on said identity card.

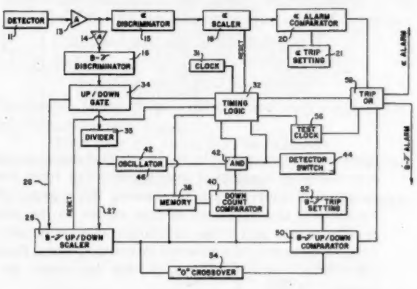
3,924,106
BACKGROUND COMPENSATION FOR A RADIATION LEVEL MONITOR

Donald J. Keefe, Lemont, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 31, 1974, Ser. No. 519,491
Int. Cl.² G06M *3/14;* **G01T** *1/00*
U.S. Cl. 235—92 PC **5 Claims**

1. In a radiation level testing device including a radiation detector for producing radiation pulses in response to radiation detected thereby and a switch which develops a switch signal when activated to initiate a radiation level test, an apparatus for developing background compensation, comprising:

an up-down counter having first and second input terminals, said up-down counter being responsive to signals applied to said first input terminal to count in a negative direction and signals applied to said second input terminal to count in a positive direction, a signal gate coupling the radiation detector to said first and second input terminals, a timing circuit coupled to said signal gate, said up-down counter and the switch, in the absence of the switch signal said timing circuit acting to develop periodically a first timing signal having a period T_1 and causing said up-down counter to reset to zero at the beginning of the period T_1, said signal gate being responsive to said first time signal to couple said radiation pulses to said first input terminal, a memory circuit coupled to the switch, said timing circuit and said up-down counter, and being capable of



generating pulses, said memory circuit being responsive to the switch signal occurring during the period T_1 of said first timing signal to apply pulses to said first input terminal until the count of said up-down counter is equal to the lowest value of the count of said up-down counter during the period T_1 of the previous first timing signal, said timing circuit being responsive to the switch signal to cause said signal gate to couple the radiation pulses to said second input terminal after said up-down counter has ceased down-counting, and a first comparator circuit coupled to said up-down counter and said switch and being responsive to a count in said up-down counter greater than a predetermined value within a period T_2 after said signal gate circuit couples the radiation pulses to said second input terminal to generate an alarm signal.

3,924,107

THE PATH OF A VEHICLE METHOD AND APPARATUS FOR RECORDING

Hideo Sakai, No. 625, Ikemodai, Takatsu-cho, Tsuchiura, Tbaragi, Japan

Continuation-in-part of Ser. No. 279,357, Aug. 10, 1972, abandoned. This application Mar. 1, 1974, Ser. No. 447,415

Claims priority, application Japan, Aug. 11, 1971, 46-60266

Int. Cl.[2] G01S *5/16*; **G06G** *7/22*

U.S. Cl. 235—150.2 **2 Claims**

2. An apparatus, for determining the path of travel of a vehicle in relation to a base line bounding a test zone, comprising:

a. two rotatable mirros each having its axis of rotation normal to said test zone, said mirros having their respective axes of rotation at spaced points on said base line,

b. two light-beam producing means disposed at spaced positions adjacent to said base line and each adapted to cast its beam onto a respective one of said rotatable mirros,

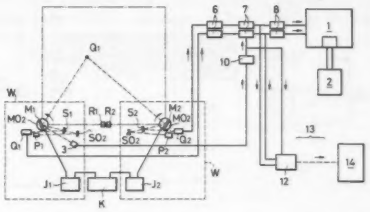
c. two stationary reflectors disposed on said base line and each positioned to reflect a beam received from a respective one of said rotatable mirros,

d. light beam reflecting means mounted on a test vehicle to be moved over said test zone,

e. motor means for rotating said rotatable mirrors in synchronism,

f. light-beam-receiving means disposed adjacent to said base line to receive light beams from said rotating mirrors,

g. a pair of digital timers responsive to said respective light beam receiving means for measuring time intervals between the mount when a light beam from each rotating mirror strikes the respective stationary reflector, and the



moment when said light beam strikes said vehicle mounted reflecting means,

h. an electronic computer means connected to said digital timers for processing said time intervals to produce *x*- and *y*-coordinate information, and

i. means connected to said computer responsive to said *x*- and *y*-coordinate information for plotting functions of movement of the vehicle on the test zone.

3,924,108

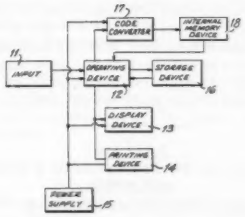
CASH REGISTER

Koichi Nakamura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 16, 1974, Ser. No. 533,425

Int. Cl.[2] G06F *13/00*

U.S. Cl. 235—152 **5 Claims**

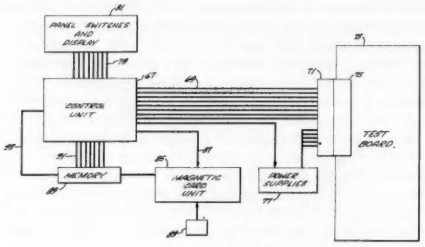


1. An electronic cash register having a limited internal storage memory adapted to store a predetermined number of classification code storage locations, the improvement comprising input means adapted to produce classification code signals representative of a plurality of classification codes in excess of the predetermined number of storage locations in said memory, and conversion means adapted to receive said classification code signals and selectively apply certain of said classification code signals to said memory for storage in said memory locations.

3,924,109
AUTOMATIC CIRCUIT CARD TESTING SYSTEM

Jai Hun Jhu, Huntington Beach; George H. Wells, Santa Ana; Thomas J. Mulder, Costa Mesa, and Don E. McDonald, Huntington Beach, all of Calif., assignors to Technology Marketing Incorporated, Santa Ana, Calif.

Filed July 22, 1974, Ser. No. 490,672
Int. Cl.[2] G05B *23/00*; **H03K** *5/18*
U.S. Cl. 235—153 AC **17 Claims**



1. Apparatus for automatically testing a variety of different digital electronic logic circuits, comprising:

a master clock;

a pulse generator responsive to said master clock for producing synchronized input signals for said logic circuits;

a connector having multiple independent electrical contacts for connecting said apparatus to said circuits;

comparator means responsive to said master clock for comparing output signals from said logic circuits with signals representing proper operation of said logic circuits;

a plurality of switching means connected to said connector contacts, said comparataor means and said pulse generators;

a control unit for sequencing said pulse generators, switching means and comparator means to produce input signals on selected ones of said connector contacts and compare output signals from selected ones of said connector contacts;

a first plurality of manually actuated switches each labeled in correspondence with one of said multiple connector contacts;

a second plurality of manually actuated switches for designating input pins, output pins, and sequences of input data signals for a specific one of said variety of different circuits; and

means responsive to said first and second plurality of manually actuated switches for storing data and for inputting data into said control unit, said data defining:

a. a sequence of operation of said switching means;

b. a sequence of operation of said pulse generator; and

c. a sequence of operation of said comparator means.

3,924,110
CALCULATOR SYSTEM FEATURING A SUBROUTINE REGISTER

Michael J. Cochran, Richardson, and Charles P. Grant, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

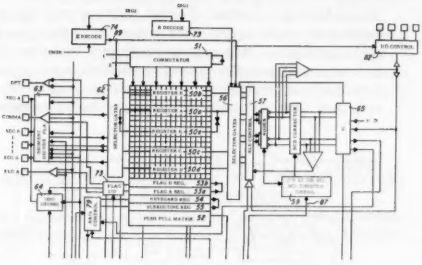
Filed Sept. 13, 1973, Ser. No. 397,056
Int. Cl.[2] G06F *9/20*
U.S. Cl. 235—156 **6 Claims**

1. In an electronic calculator system implemented on at least one semiconductor chip, having a clock system for providing cycle and sub-cycle timing, instruction memory means for storing instructions, address register means for addressing the instruction memory means, and input means for receiving external commands, ultimately as addresses of the instruction memory means, the improvement comprising:

a. keyboard storage means, operatively connected to the input means for storing multi-bit instruction memory addresses and selectively connected to the address register means for transmitting the memory addresses;

b. sub-routine storage means, selectively connectable only to the keyboard storage means, for receiving and storing memory addresses, and for selectively transmitting memory addresses back to the keyboard storage means; and

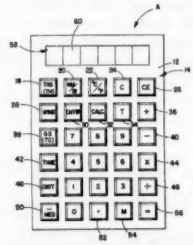
c. control means, operatively connected to the address register means, the keyboard storage means, the sub-routine storage means, and to the instruction memory means, responsive to a selected instruction word from the instruction memory means for causing the transfer of the contents of the keyboard storage means to the address register means and to the subroutine storage means and, under the control of a selected instruction word, from the sub-routine storage means to the keyboard storage means.



3,924,111
ELECTRONIC CALCULATORS FOR NAVIGATIONAL PURPOSES

Charles R. Farris, 235 E. Hazel St., Inglewood, Calif. 90302

Filed Sept. 25, 1974, Ser. No. 509,072
Int. Cl.[2] G06F *15/50*, *9/18*
U.S. Cl. 235—156 **17 Claims**



1. An electronic hand-held pocket-sized portable calculator for aiding the solution of navigational-type problems encountered in the navigation of airborne equipment, said calculator comprising:

a. first manually operable input means having a plurality of manually operable data input elements for introducing navigational-type data,

b. second manually operable input means for introducing a first instructional command to enable a computation based on any of time, speed or distance functions based on said introduced nagivational-type data,

c. third manually operable input means for introducing a second instructional command to enable a ground speed, air speed or wind vector function computation based on said introduced navigational-type data,

d. a fourth manually operable input means for introducing a third instructional command to enable a conversion

function computation based on said introduced navigational-type data,

e. first programmed memory means operatively connected to said first, second, third, and fourth input means to receive navigational-type data and said instructional commands,

f. arithmetic control means operatively connected to said first memory means to perform mathematical computations on the data pursuant to the instructional commands,

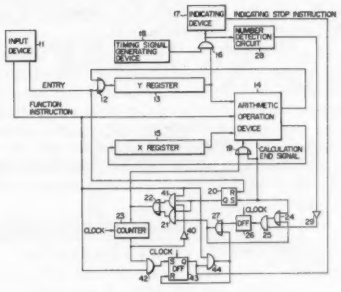
g. second programmed memory means operatively connected to said arithmetic control means and input means, and

h. display means operatively connected to said second memory means for displaying computational results of the mathematical computations on the navigational-type data to provide a navigational-type solution based on the data input and the introduced instructional commands.

3,924,112
ELECTRONIC CALCULATOR

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Higashiyamato, Japan

Filed July 29, 1974, Ser. No. 492,857
Claims priority, application Japan, July 30, 1973, 48-84967
Int. Cl.² G06F *3/14;* **G06K** *15/18*
U.S. Cl. 235—156 **13 Claims**



1. An electronic calculator having input means for supplying numerical input information and function instruction, arithmetic operation means for effecting an arithmetic operation on the numerical input information in response to the function instruction, and register means coupled between said input means and said arithmetic operation means and adapted to store the numerical input information and the results of the arithmetic operation, the electronic calculator further including:

indicating means coupled to said register means and adapted to display one of digits of the numerical input information stored in said register means;

first control means coupled to said register means for feeding to said indicating means one of the numerical input information stored in said register means;

second control means coupled to said register means for starting the shift of the numerical input information in said register means when said arithmetic operation means finishes an arithmetic operation, for detecting the arrival of a terminal digit of the numerical input information at a feed-out position of said register means from which the digits of the numerical input information are to be fed successively to said indicating means, and for stopping the shift of the numerical input information when said detection is made;

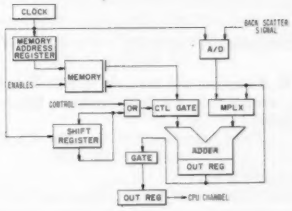
third control means coupled to said register means for reading out the numerical input information digit by digit from said register means after the terminal digit of the numerical input information reaches said feed-out position of the register means and for shifting succeeding numerical input information digit by digit to said feed-out position of said register means; and

detecting means for detecting the display of the terminal significant digit of said numerical information, to thereby ascertain that all the digits thereof have been displayed.

3,924,113
ELECTRON BEAM REGISTRATION SYSTEM

Charles D. Gill, Pleasant Valley, and Philip M. Ryan, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 8, 1973, Ser. No. 368,384
Int. Cl.² G06F *15/34;* **H01J** *37/28*
U.S. Cl. 235—181 **14 Claims**



8. Apparatus for providing the true position of a noise corrupted signal comprising:

means for sampling said noise corrupted signal and providing a binary value representative of the amplitude of the sampled noise corrupted signal;

adder means operatively associated with and responsive to said means for sampling, said adding means also being operatively associated with and responsive to binary signals provided by an electronic memory;

said adder means adding the data contained in a selected address of memory to the sampled noise corrupted signal and providing said result to the said same selected address of electronic memory;

a second electronic memory storing a predetermined binary pattern;

gating means electrically connected between said first electronic memory and said adding means for transferring data from said first electronic memory to said adding means under the control of said second electronic memory, and

output means for providing the output of said adding means to a computing means for determining the center of a waveform representative of the binary output of said adding means.

3,924,114
ILLUMINATED YO-YO

Gil C. Sanchez, 2915 Miles Ave., Bronx, N.Y. 10465

Filed July 14, 1972, Ser. No. 271,676
Int. Cl.² F21V *33/00;* **A63H** *27/12, 33/26*
U.S. Cl. 240—6.4 R **1 Claim**

1. An illuminated yo-yo comprising a pair of hollow shell sections each having a removable cover and formed of translucent material and joined together by an axle to define a groove for receiving a coil of string, and a light system disposed in each shell section to produce a blinking light when the yo-yo is caused to rotate, each light system comprising:

A. a cylindrical battery disposed in said shell along the diameter thereof, said battery having a positive pole at one end and a negative pole at the other end,

B. a light bulb fixedly disposed adjacent one side of the battery in parallel relationship therewith to define a nar-

row space therebetween, said bulb having an envelope containing a filament, base contact and a tip contact, said shell having integral tabs and other means integral with the shell to maintain the position of the battery and of the bulb while exposing the base contact of said bulb in said narrow space,

C. a first conductive strip of resilient material, one end portion of which engages one pole of said battery, the other end portion engaging the tip contact of the bulb, and

D. a second conductive strip of resilient material, one end portion of which engages the other pole of said battery, the other end portion extending into the space between the battery and the exposed base contact and being normally out of engagement with said base contact, said other end portion being caused by centrifugal force intermittently to engage said contact in the course of yo-yo rotation.

3,924,115
ELECTROMAGNETIC PICK UP TOOL WITH BUILT-IN LIGHT

Harold E. Hampton, and Leonard D. Ellard, both of Ogallala, Nebr., assignors to 3 B & D Products, Incorporated, Ogallala, Nebr.

Filed June 14, 1974, Ser. No. 479,576
Int. Cl.[2] F21L *7/00*
U.S. Cl. 240—6.4 R **15 Claims**

1. Portable apparatus for locating and retrieving magnetically attractable objects from otherwise inaccessible locations comprising:

a hand-held unit;

at least one battery internally carried by said unit to provide a source of electrical current;

an incandescent light bulb carried internally by said unit;

a first switch means carried by said unit for selectively applying electrical current from said at least one battery to said light bulb;

a flexible member having two ends, one end being connected to said unit adjacent said light bulb;

a flexible light conduit carried internally of said flexible member for conveying light from said light bulb through the length of said flexible member to exit the second end of said flexible member;

an electromagnet carried by the second end of said flexible member radially outward of said conduit, said electromagnet having a cross-sectional configuration which approximates the cross-sectional configuration of said flexible member and a sharply curtailed lateral magnetic flux field whereby the electromagnet is not attracted laterally to magnetically attractable objects; and

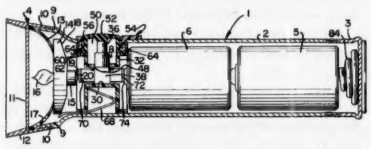
a second switch means carried by said unit for selectively applying electrical current from said at least one battery to said electromagnet.

3,924,116
FLASHLIGHT HAVING A PUSH BUTTON SWITCH MEANS

Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 4, 1974, Ser. No. 503,094
Int. Cl.[2] F21L *7/00, 15/00*
U.S. Cl. 240—10.6 R **10 Claims**

1. A flashlight comprising a lens and reflector unit having a front open end adapted to be detachably mounted to a battery casing and having a lens, a lens ring, a lamp holder adapted for accommodating a lamp and containing a first contact means therein; a battery casing provided with a first open end adapted to receive battery means and adapted to be detachably mounted to an end cap for securing said battery means therein, a second open end at the opposite end thereof adapted to be detachably mounted to the front open end of the lens and reflector unit, and wherein second contact means are provided for electrically connecting the interior vicinity of the end cap to said first contact means; a push button switch fixedly secured on a mounting bracket disposed within the second open end of the battery casing with the button member of the switch disposed within an opening in the wall of the battery casing at the vicinity of the second open end thereof and having a flexible boot member disposed and secured over

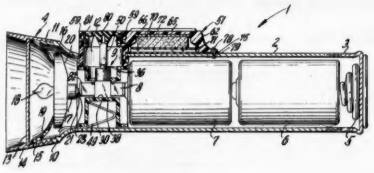


said opening so that upon being depressed, the boot will in turn depress the button member of the switch; and third contact means adapted through activation of the push button switch in the presence of a lamp bulb and battery means assembled in the flashlight to complete or interrupt the continuity of an electrical circuit between the lamp bulb and the battery means.

3,924,117
FLASHLIGHT HAVING A MAGNET-SWITCH COMBINATION

Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,722
Int. Cl.[2] F21L *7/00, 15/00*
U.S. Cl. 240—10.6 R **8 Claims**



1. A flashlight comprising a lens and reflector unit having a front open end adapted to be detachably mounted to a battery casing and having a lens, a lens ring, a lamp holder adapted to accommodate a lamp and containing a first contact means therein; a battery casing provided with a first open end adapted to receive a battery means and adapted to be detachably mounted to an end cap for securing battery means therein, a second open end at the opposite end thereof adapted to be detachably mounted to the front open end of the lens and reflector unit, and wherein second contact means are provided for electrically connecting the interior vicinity of the end cap to said first contact means; a push button switch fixedly secured on a mounting bracket disposed within the second open end of the battery casing with the button member of the switch disposed within an opening in the wall of the battery casing adjacent the second open end thereof; a housing member substantially disposed on the outer surface of the battery casing and having an opening disposed therein with magnetic means disposed in the surface of said housing member adjacent said opening, said housing member aligned and secured to the battery casing such that the opening in said housing member is aligned with the opening in the wall of the casing so as to accommodate the button member of the switch disposed in the opening in the wall of the casing; a flexible boot member disposed and secured over the opening in the housing member so that upon being depressed, the boot will in turn depress the button member of the switch; and third contact means adapted through actuation of the push button switch in the presence of a lamp and battery means assembled

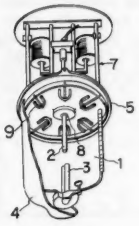
in the flashlight to complete or interrupt the continuity of an electrical circuit between the lamp and the battery means.

3,924,118

ARC LAMP FOR A WEATHERMETER AND PROVIDED WITH MAGNET MEANS

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Jan. 14, 1975, Ser. No. 540,974
Claims priority, application Japan, Oct. 3, 1974, 49-113354
Int. Cl.² F21K *5/00*
U.S. Cl. 240—11.2 A **3 Claims**



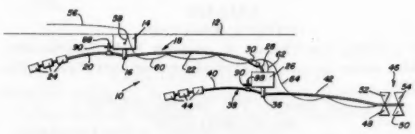
1. In an arc lamp, particularly for use in a weathermeter, and having a radiation portion which includes a glass globe, carbon electrodes within the globe one of which is movable, an electrode support plate covering the globe and having a gas-tight bushing therein through which the movable electrode extends, the improvement comprising magnet means disposed on the inner surface of said support plate within said globe for collecting in the vicinities of the magnetic poles of said magnet means ashes being produced by the combustion of said carbon electrodes during the carbon arc discharge radiation to prevent diffusion of said ashes and preventing adhesion of said ashes to light transmitting portions of said glass globe, thereby obtaining undimmed transmitted light.

3,924,119

ROTATIONAL LIGHTING SYSTEM

Murray Tovi, 585 West End Ave., New York, N.Y. 10024

Filed Aug. 9, 1974, Ser. No. 496,191
Int. Cl.² F21V *21/00*
U.S. Cl. 240—52 R **14 Claims**



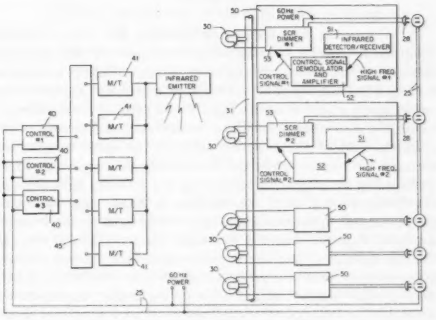
1. A horizontal, remotely controlled lighting system in which a source of illumination can hover over substantially any given region of an area to be illuminated, the lighting system comprising: a first motor element adapted to be fixedly mounted relative to the area to be illuminated, said first motor element having a first rotable motor shaft; a first elongated support arm having first and second ends, said first support arm being mounted on said first motor shaft intermediate its first and second ends, for rotation with said first motor shaft, and in a substantially horizontal plane; a second motor element suspended from the first end of said first support arm, said second motor element having a second rotatable motor shaft; a second elongated support arm having first and second ends, said second support arm being mounted on said second motor shaft intermediate its first and second ends, for rotation with said second motor shaft, and in a substantially horizontal plane; lighting means mounted at the first end of said second support shaft; counterweight means mounted at the second end of said second support arm, weighted and positioned so that said second support arm, said counterweight means and said lighting means are in substantial horizontal balance about said second motor shaft; second counterweight means mounted at the second end of said first support arm, weighted and positioned so that said first support arm, carrying the associated second motor element, second support arm, second counterweight means and lighting means, is in substantial horizontal balance about said first motor shaft; and control means for independently controlling the operation of said first and second motor elements and thereby the respective rotatable motor shafts, and said lighting means; and wherein the distance between the first end of said first support arm and the first motor shaft is substantially equal to the distance between the first end of said second support arm and said second motor shaft.

3,924,120

HEATER REMOTE CONTROL SYSTEM

Charles H. Cox, III, 38 Lakehill Ave., Arlington, Mass. 02174

Continuation-in-part of Ser. No. 230,378, Feb. 29, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 397,219
Int. Cl.² H04B *9/00*
U.S. Cl. 250—199 **11 Claims**



1. In a theatre system having a plurality of theatre instruments, an optimal control system for simultaneously operating select ones of said instruments at any level in the operational range thereof while maintaining optimal flexibility in location of said instruments, said control system comprising:

a. a plurality of instruments located at respective positions in the theatre, each having a different identification code and each including a photosensitive detector, a digital signal decoder, and an actuation control means;

b. a source of signals, said signals representing specified variations in the operation of select ones of said instruments;

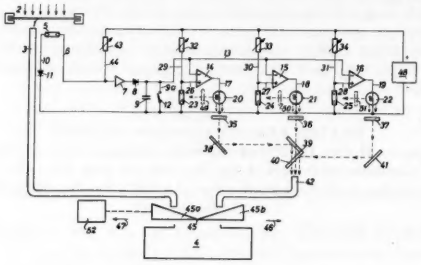
c. means for converting said signals from said source to a predetermined digitally coded signal, said code being conditioned to energize actuation control means to bring said instruments selectively to desired operating levels, said means for converting including means for multiplexing signals for a plurality of instruments into an aggregate digital signal of predetermined format to associate control information for a given one of said instruments with the corresponding identification code;

d. optical transmission means including means for translating said aggregate signal into infrared energy, and at least one continuous optical transmission path between said means for translating and each of said photosensitive detectors, whereby transmitted aggregate signals from said optical transmission means contain all actuation control level change information for said theatre, and individual ones of said instruments are conditioned to extract corresponding infrared control signals and to reject infrared control signals which correspond to other ones of said instruments.

3,924,121
PROCESS AND APPARATUS FOR UNDERCOMPENSATING PHOTOGRAPHIC COLOR PRINTING

Siegfried Barbieri, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate, Bolzano, Italy

Filed Jan. 21, 1974, Ser. No. 435,249
Claims priority, application Italy, Jan. 26, 1973, 4807/73
Int. Cl.[2] G03B *27/78*; **G01J** *3/34*
U.S. Cl. 250—226 **26 Claims**

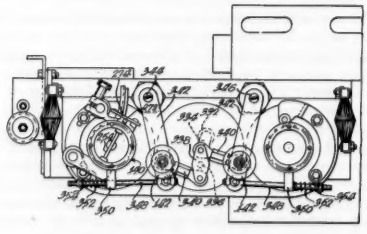


1. A process for undercompensating the color balance obtained in making colored prints from colored photographic transparencies by a photographic color printing apparatus having a measuring head which terminates the exposures of the printing material to the light of the primary color components in the printing light when predetermined amounts of the printing light of the primary color components transmitted through the transparency are detected by the measuring head, comprising the steps of transmitting the printing light through the transparency onto the measuring head, and impinging supplemental light outside of the printing light on the measuring head together with the printing light transmitted through the transparency, and the supplemental light having primary color components in a predetermined ratio which is independent of the color content of any particular transparency, whereby the balance of the primary color components in the colored prints is undercompensated relative to the predetermined amounts of the primary color components in the printing light which are detected by the measuring head.

3,924,122
ROTARY DRIVE ELEMENT WITH OPTICAL SENSOR

Jack A. Russell, Spring Lake; Goodrich B. Pratt, Grand Haven, and Anthony J. Gretzky, Muskegon, all of Mich., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 69,768, Sept. 4, 1970. This application Dec. 20, 1973, Ser. No. 426,505
Int. Cl.[2] H01J *3/14*
U.S. Cl. 250—236 **4 Claims**

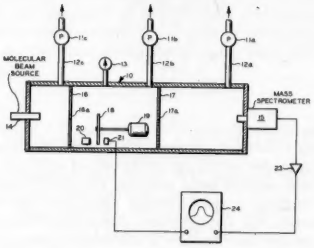


1. In a random access information retrieval system wherein information bits are stored at a plurality of different locations on a strip like medium, the combination comprising: means, including a medium engaging rotary drive element, for positively engaging and driving the medium through an information retrieval station; means for selectively controlling said drive means for causing the same to dispose a selected bit of information on the medium at the retrievel station; and means including a portion of said medium engaging rotary drive element and rotatable therewith, for optically sensing code information on the medium disposed between the bits of information thereon for continuously providing information identifying the bit of information then in the retrieval station.

3,924,123
MEASUREMENT OF SECOND VIRIAL COEFFICIENTS

Thomas W. Schmidt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 6, 1974, Ser. No. 467,251
Int. Cl.[2] G01N *11/02*
U.S. Cl. 250—251 **9 Claims**

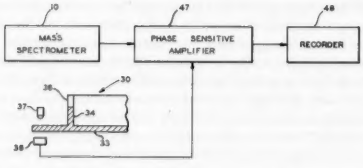


1. The method of obtaining data from which the second virial coefficient of a gaseous mixture of first and second constituents can be calculated, which method comprises the steps of passing a molecular beam of a gaseous mixture of said first and second constituents to be analyzed through a time of flight zone from a source to a detector spaced from the source, separately measuring the velocity distribution of each of said first and second constituents of the beam, and measuring the temperature of the constituents forming the beam, such temperature measurement being conducted independently of the measured velocity distribution step.

3,924,124
ISOTOPE ANALYSIS

John A. Favre, and Thomas W. Schmidt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 3, 1974, Ser. No. 475,774
Int. Cl. H01j *39/34*
U.S. Cl. 250—281 **6 Claims**



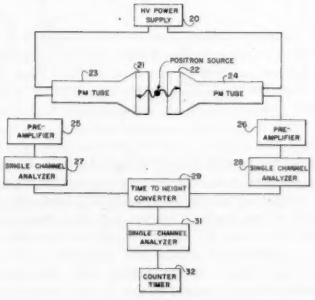
1. Analysis apparatus comprising:
a mass spectrometer having an inlet to receive samples of gas to be analyzed, said mass spectrometer being capable of providing an output signal representative of a selected isotope in a gas sample introduced into the mass spectrometer;

means to direct a beam of a first gas toward said inlet;
means to direct a beam of a second gas toward said inlet;
shutter means positioned in the two beams;
means to actuate said shutter means so that the two beams are passed to said inlet alternately;
a phase sensitive detector;
means to apply said output signal from said mass spectrometer to said detector;
means responsive to said means to actuate to establish a reference signal of a frequency corresponding to the frequency at which the two beams are alternately passed to said inlet; and
means to apply said reference signal to said detector.

3,924,125
ACTIVATED ALUMINUM TRACER TAG

Kenneth M. Murray, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,289
Int. Cl.[2] G01T *1/16*; G21H *5/02*
U.S. Cl. 250—303 **3 Claims**



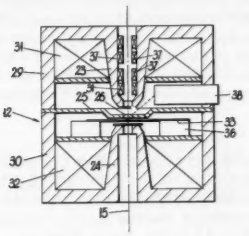
1. A method of treating an aluminum element for the purpose of detecting said treated aluminum in an assembly in the presence of other masking materials; which comprises,
irradiating said aluminum part with X-rays with an energy of at least 23 MeV to produce the reaction $^{27}Al(\gamma,\alpha n)^{2}$-$^{2}Na$.

3,924,126
ELECTRON MICROSCOPES

Kenneth Anderson, Bramhall, and Kenneth Arthur Brookes, Bolton, both of England, assignors to Associated Electrical Industries Limited, London, England

Filed June 26, 1974, Ser. No. 483,126
Claims priority, application United Kingdom, June 28, 1973, 30764/73
Int. Cl.[2] H01J *37/26*
U.S. Cl. 250—311 **13 Claims**

1. A combined condenser and objective lens for an electron microscope comprising:
a. first and second pole pieces, said pole pieces defining, respectively, first and second apertures, said first and second apertures being aligned on a common axis;
b. a third, relatively thin pole piece disposd intermediate of and spaced from said first and second pole pieces for defining respective condenser and objective lens gaps between the first, third, and second pole pieces, said third pole piece defining a third aperture aligned with said common axis;
c. a magnetic yoke coupling said first and second pole pieces and said third pole piece;
d. first and second electrical windings connected to said first and second pole pieces, respectively;



e. power supply means for inducing, in operation of said combined lens, magnetic flux through said magnetic yoke and across said first and second gaps, respectively, and
f. mounting means for mounting a specimen within said second gap.

3,924,127
METAL SCREENS USED FOR INDUSTRIAL RADIOGRAPHY

Jacques Chéret, 64, Avenue Marguerite Renaudin, 92 Clamart; André Nouvet, 13, rue Jules Simon, 75 Paris, and Noël Cocoual, 8, bis Avenue Guillemin, 92 asnieres, all of France

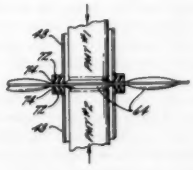
Continuation of Ser. No. 205,567, Dec. 7, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,628
Claims priority, application France, Dec. 8, 1970, 70.44141
Int. Cl. H01j *1/54*
U.S. Cl. 250—323 **10 Claims**

1. A cassette for use in radiographic investigation of a specimen, in order to improve the image quality, the specimen being located between a radiation source of X or γ rays, said cassette comprising inside a body, a radiographic film, a front screen in contact with the front surface of the film facing said specimen, a back screen in contact with the rear surface of the film, said back screen being constituted of lead, said front screen being constituted of elemental nickel or an base copper alloy containing nickel, the elemental nickel screen or alloy containing not more than a total of 4% of any other element.

3,924,128
APPARATUS FOR HANDLING FLEXIBLE CONTAINERS FOR LIQUID SAMPLE SPECTROMETRY

Edmund Frank, Chicago, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Division of Ser. No. 259,767, June 5, 1972. This application Dec. 28, 1973, Ser. No. 429,074
Int. Cl. G01t *7/08*
U.S. Cl. 250—328 **9 Claims**



1. In an apparatus for spectrally analyzing test samples containing one or more radioactive isotopes disposed in a liquid scintillator and adapted to handle flexible sample containers formed by joining layered, flexible light-transmissive, polyester film to define a bag portion therein, light tight housing means including a counting station, at least one photomul-

tiplier detection device in said housing and means, for axially shifting said photomultiplier detection device toward and away from said counting station, the improvement comprising, a resilient member surrounding the end of said photomultiplier detection device adjacent said counting station, said resilient member being disposed to contact the flexible sample container disposed in the counting station and surround the entire periphery of the bag portions thereof when said photomultiplier detection device is axially shifted toward the sample container to its preselected position for counting.

3,924,129

METHOD AND APPARATUS FOR CONSTRUCTING A REPRESENTATION OF A PLANAR'S SLICE OF BODY EXPOSED TO PENETRATING RADIATION

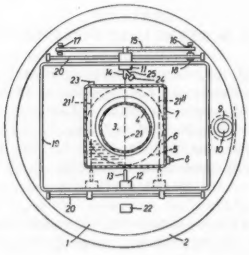
Christopher Archibald Gordon LeMay, Osterley, England, assignor to E M I Limited, Hayes, England

Filed Apr. 18, 1974, Ser. No. 462,104

Claims priority, application United Kingdom, Apr. 25, 1973, 19528/73; Aug. 21, 1973, 39420/73; Oct. 11, 1973, 47507/73

Int. Cl. G01t 1/16

U.S. Cl. 250—336 **21 Claims**



1. A method of constructing a representation of the variation of absorption of a planar slice of a body with respect to penetrating radiation which comprises the steps of:

a. providing a plurality of sets of *m* beam data signals where *m* is of the order of 50 or greater, the signals of each set being related to the logarithm of the absorption of a corresponding set of substantially parallel beams of said radiation in the plane of said slice, and the sets of signals corresponding effectively to sets of parallel beams, orientated at different angles in said plane,

b. providing a series of factor signals of which the number of terms is of the order of the number *m* of effective beams per parallel set, said factor signals at least after the factor signal of order 5 conforming to a substantially monotonic function,

c. deriving for a particular beam data signal a summation signal by forming the sum of said beam data signal multiplied by the zero order factor signal, the next adjacent beam data signals of the same set multiplied by the first order factor signal, the second adjacent beam data signals of the same set multiplied by the second order factor signal and so on over a desired range,

d. deriving for other beam data signals, some in every set, respective summation signals by repeating method step (c) in respect of each said other beam data signals,

e. forming the sum of summation signals corresponding to beams of different sets intersecting a particular elementary area of the planar slice to produce a signal representing the absorption of said elementary area,

f. repeating method step (e) in respect of other elementary areas of said planar slice, thereby to construct said representation,

g. said substantially monotonic function being such that the signal representing the absorption of any elementary area is successively more accurately compensated for absorption suffered outside the respective elementary area by the beams intersecting the respective elementary area, as successively higher order factor signals multiplied by respective beam data signals are utilised in the formation of said summation signals.

3,924,130

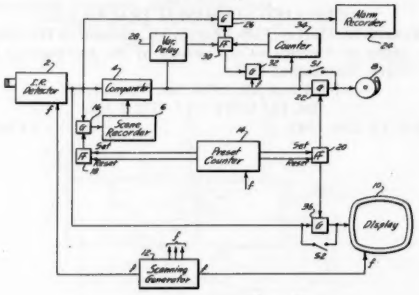
BODY EXPOSURE INDICATOR

Allen Cohen, Orlando, Fla., and Hugo J. Caligiuri, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1968, Ser. No. 706,750

Int. Cl.² G01J 1/00

U.S. Cl. 250—342 **8 Claims**



1. In a detector system for detecting the presence of warm bodies in a selected area, the improvement comprising:

detector means for periodically scanning said selected area to detect warm bodies therein, recorder means for periodically recording the signals developed by said detector means, comparator means for comparing the output signals from said detector means with previous signals from said detector means stored in said recorder means, alarm means for generating an alarm signal responsive to a difference signal from said comparator means when said detector output signal differs from said previous detector output signal recorded in said recorder means, and first gating means for selectively gating said difference signal from said comparator means to said alarm means.

3,924,131

METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION

Godfrey Newbold Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 349,242, April 9, 1973, which is a continuation-in-part of Ser. No. 212,778, Dec. 27, 1971, Pat. No. 3,778,614, which is a continuation of Ser. No. 861,538, Aug. 21, 1969, abandoned. This application May 9, 1974, Ser. No. 468,551

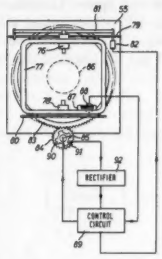
Claims priority, application United Kingdom, Aug. 23, 1968, 40317/68

Int. Cl.² G01N 23/00, 23/02, 23/04

U.S. Cl. 250—360 **5 Claims**

1. Apparatus utilizing penetrating radiation such as X- or γ-radiation to evaluate a variable absorption coefficient with respect to said radiation in a plane within a body, including a source of said radiation and detecting means for detecting a beam, radiated from said source, after passage through said body in said plane, said detecting means and said source on the one hand and said body on the other hand being relatively movable so that output signals can be obtained representing the absorption by said body of beams at a plurality of angularly and laterally spaced positions, and means for utilizing

said output signals to effect said evaluation, said apparatus further comprising a scanning frame on which said source and said detecting means are mounted, facing each other across an aperture in which said body can be positioned so that said beams of radiation pass through said body in said plane, said source and said detecting means being mounted for orbital scanning movement about an axis normal to said plane and also for lateral scanning movement to cause said detecting means to pick up radiation successively from respective beam



paths through the body which are disposed across the lateral extent of said body in said plane, and means for producing interrelated orbital and lateral scanning movements of said source and said detecting means in such a way that for each of a series of successive increments of said orbital movement a lateral scanning movement occurs from which there is derived a set of output signals corresponding to the absorption suffered by said radiation on traversing said beam paths, successive sets of such output signals being derived after said successive increments of orbital movement.

3,924,132

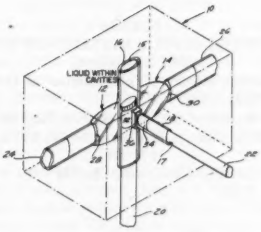
ELEMENT ANALYZER UTILIZING NEUTRON ACTIVATION

Evan E. Koslow, 5 Town Crier Lane, Westport, Conn. 06880

Filed May 30, 1974, Ser. No. 474,395

Int. Cl.² G01T *1/20*

U.S. Cl. 250—361 **38 Claims**



1. Apparatus for the analysis of a specimen wherein a sample is prepared from the specimen and a dielectric medium, said apparatus comprising a base having a portion defining a substantially eliptical cavity therein, means for placing the sample in said cavity, a neutron source positioned to irradiate the sample to emit particles, detector means for detecting photons emitted during the passage of these particles through the medium and for generating a signal in accordance with the occurrence thereof and means operably connected to said detector means for processing said signals.

3,924,133

DEVICE FOR MEASURING DENSITY OF SUBSTANCES BY PENETRATING RAYS

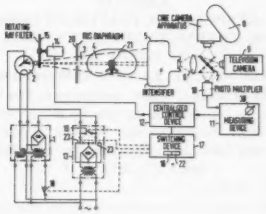
Karl-Hanz Reiss, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 10, 1971, Ser. No. 170,497

Claims priority, application Germany, Aug. 27, 1970, 2042009

Int. Cl.² H05G *1/30*

U.S. Cl. 250—408 **6 Claims**



1. A device for measuring density of substances of living objects, comprising an X-ray tube device adapted to project X-rays upon an object, a ray measuring device adapted to be located behind the object and producing electrical values corresponding to ray intensity values, a generator supplying the X-ray tube with high voltage, a switching device connected with said X-ray tube device and with said ray measuring device and switching a low value of the high voltage which, however, is clearly above the K-absorption edge of the object body, in rhythmical sequence to a higher value, and an actuating device connected with said X-ray tube device and with said ray measuring device and synchronized by the switching frequency to lower the ray intensity during the application of the high voltage value in such manner that for two voltage values behind an average object intensity values are present corresponding to the linear measuring range of said ray measuring device, said ray measuring device integrating for a certain constant time period the crest range of electrical values measured during each time period when the X-ray tube was switched on and forming a quotient from the two values.

3,924,134

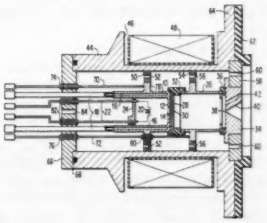
DOUBLE CHAMBER ION SOURCE

Myron F. Uman, Silver Springs, Md.; James R. Winnard, Poughkeepsie, N.Y., and Harold F. Winters, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,312

Int. Cl.² G01T *1/20*

U.S. Cl. 250—423 **3 Claims**



1. An ion source comprising a first cylindrical chamber, filament means disposed in said first chamber, a second cylindrical chamber axially aligned with said first cylindrical chamber, wall means separating said first and second chambers and

having aperture means therein, end closure wall means disposed at the opposite end of said second chamber and having extraction orifice means therein, said filament means, said aperture means and said orifice means being axially aligned with each other, voltage supply means connected to said filament means and said first and second cylindrical chambers to maintain a separate arc discharge in each of said chambers and magnetic field generating means surrounding said chambers to provide an axially directed magnetic field.

3,924,135
DIRECT-RESPONSE ULTRAVIOLET DOSIMETER UTILIZING THERMOLUMINESCENT MAGNESIUM OXIDE

Ashok K. Dhar, Niles, Ill.; Larry A. DeWerd, and Thomas G. Stoebe, both of Seattle, Wash., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

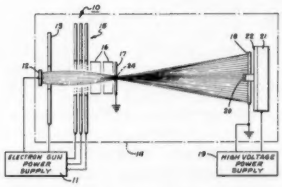
Filed Nov. 26, 1974, Ser. No. 527,280
Int. Cl.[2] G01T *1/11*
U.S. Cl. 250—484 **6 Claims**

1. A direct response thermoluminescent dosimeter responsive to ultraviolet radiation consisting essentially of nominally pure magnesium oxide.

3,924,136
CHARGED PARTICLE APODIZED PATTERN IMAGING AND EXPOSURE SYSTEM

Louis N. Heynick; Eugene R. Westerberg, both of Palo Alto; Alfred J. Bahr, Mountain View, and Robert E. Lee, Los Altos, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Feb. 18, 1975, Ser. No. 550,642
Int. Cl.[2] H01J *37/12*
U.S. Cl. 250—492 A **15 Claims**

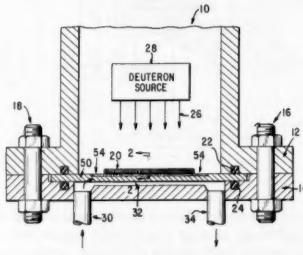


1. A beam forming and imaging system comprising:
charged particle source means of directing charged particles along a path;
a source mask disposed in said path and having at least one aperture therein, whereby charged particles directed along said path pass through the said aperture in said source mask;
a target disposed in said path;
an imaging plate disposed in said path between said target and said source mask, comprising a member opaque to said charged particles and having at least one slit therein, said slit being substantially long in length and relatively narrow in width;
a voltage source connected between said imaging plate and said target and adapted to produce an electrical field therebetween, said electrical field convergent only in a direction parallel to said relatively narrow width, said convergent electrical field present along the substantially long length of said slit, whereby the charged particles in said path are focused by the convergent electrical field to form a one dimensionally converged image of said slit on said target for each aperture in said source mask; and
an apodizing mask comprising a member opaque to said charged particles and extending transversely across the said slit in said imaging plate, thereby to divide the said converged image of said slit on said target into at least two segments.

3,924,137
DEUTERIUM PASS THROUGH TARGET

Donald L. Alger, Cleveland, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Aug. 27, 1974, Ser. No. 500,980
Int. Cl.[2] G21G *4/02*
U.S. Cl. 250—499 **13 Claims**

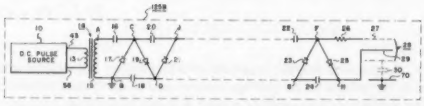


1. For use in neutron generating apparatus including a deuteron source and an accelerator vacuum chamber, an improved neutron emitting target comprising a target layer containing tritium for reaction with deuterons from the deuteron source; an accumulation layer for accumulating deuterons which have passed through said target layer, the thickness of said accumulation layer being such that deuterons which have passed through the target layer come to rest therein; and a nonhydrogenizeable metal support on which said target and accumulation layers are supported, said support having at least one portion of one surface thereof exposed to the accelerator vacuum chamber and said support including means for communicating the accumulation layer with said at least one exposed portion of the surface of said support such that deuterons which are accumulated by said accumulation layer are returned to the accelerator vacuum chamber.

3,924,138
PULSED POWER SUPPLY SYSTEM FOR NEUTRON WELL LOGGING

Eric C. Hopkinson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 166,791, July 28, 1971, Pat. No. 3,714,468. This application June 30, 1972, Ser. No. 267,780
Int. Cl.[2] G21G *4/02*; H05H *5/00*
U.S. Cl. 250—502 **9 Claims**



1. In a circuit for pulsing an ion source in an accelerator tube having an anode and a cathode, the improvement comprising:
a voltage multiplier circuit having one output at a first voltage potential and a second output at a second voltage

potential, said second output being connected to the anode of said accelerator tube; and

a resistor connected between said first output and the cathode of said accelerator tube.

3,924,139

APPARATUS FOR PHOTO-OXIDATION OF WATER

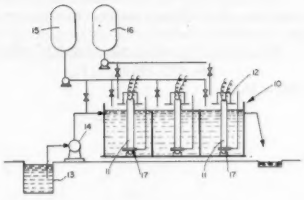
Michio Hirose; Mitsunobu Otani; Kiyoshi Yamada; Naoyuki Mitani, all of Otsu, and Kiyotugu Tanaka, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 321,974, Jan. 8, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,584

Claims priority, application Japan, Jan. 7, 1972, 47-4329; Feb. 5, 1972, 47-12953; Apr. 1, 1972, 47-32982; May 26, 1972, 47-51679; May 30, 1972, 47-52938

Int. Cl.[2] A61L *3/00;* **B01K** *1/00*

U.S. Cl. 250—527 **7 Claims**



1. Apparatus for purifying waste water by photooxidation reaction which comprises:

a. plural reaction chambers, each reaction chamber having at least one inlet and at least one outlet for water,

b. at least one water passageway connecting the outlet of one reaction chamber with the inlet of a second reaction chamber in order to connect said chambers for sequential treatment of waste water wherein the inlet of the first reaction chamber in said sequence is adapted to be connected to a supply of waste water to be treated, and the outlet of the last chamber in said sequence is adapted to discharge purified water from the apparatus.

c. ultraviolet light sources vertically suspended in said each reaction chamber from the top of said reaction chamber near the center thereof, and having outer surfaces adapted to be immersed in and in contact with the water to be treated,

d. inlets for chemicals or/and oxidizing agent arranged in at least two of said reaction chambers, and

e. gas supply devices disposed in each of said chambers near the bottom of said ultraviolet light source therein, at a distance not further than 10 cm. from the wall of the light source, and arranged to provide a gas flow against those surfaces of said ultraviolet light sources which are adapted to be in contact with the water to be treated, and further adapted to agitate waste water near said light source, so that waste water supplied from the inlet of the first reaction chamber is oxidized and purified in said chambers by ultraviolet light together with suitable oxidizing agent as said water flows from the first reaction-chamber to the final reaction chamber through said sequentially arranged chambers and the passageways therebetween, and purified water is discharged from the outlet of the final reaction chamber.

3,924,140

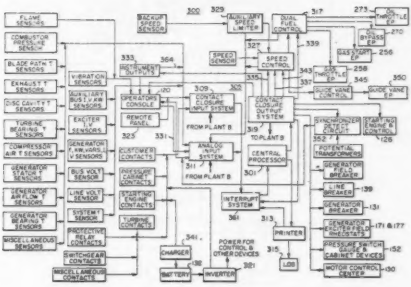
SYSTEM FOR MONITORING AND CONTROLLING INDUSTRIAL GAS TURBINE POWER PLANTS INCLUDING FACILITY FOR DYNAMIC CALIBRATION CONTROL INSTRUMENTATION

Robert A. Yannone, Aldan, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 14, 1972, Ser. No. 234,580

Int. Cl.[2] H02P *9/04*

U.S. Cl. 290—40 **9 Claims**



1. A gas turbine electric power plant comprising:

a. a gas turbine including compressor, combustion and turbine elements;

b. a generator drivably coupled to said turbine for generating electric power;

c. means for supplying fuel to said gas turbine combustion element;

d. means for selectively coupling said generator to an external power system;

e. means for controlling the operation of said plant including a computer and means for operating said computer to effect control action by said control means in a predetermined manner, said control means also including means for actuating said coupling means when a particular selected parameter of said actuating means reaches a predetermined value to effect coupling of said generator to the external power system;

f. means, responsively coupled to said control means, for operating said fuel supply means to cause fuel to be supplied to said combustion element in controlled quantities, and

g. detection means responsively connected to said actuating means, said coupling means and said control means for monitoring the actual value of said selected parameter at the time said coupling means is actuated and for generating one or more dynamic calibration signals representative of the difference between the predetermined and actual values of said selected parameter for use by said control means.

3,924,141

GAS TURBINE POWER PLANT CONTROL APPARATUS INCLUDING A TWO-SHOT SHUTDOWN SYSTEM

Robert A. Yannone, Aldan, and James J. Shields, Philadelphia, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1973, Ser. No. 371,627

Int. Cl.[2] H02P *9/04*

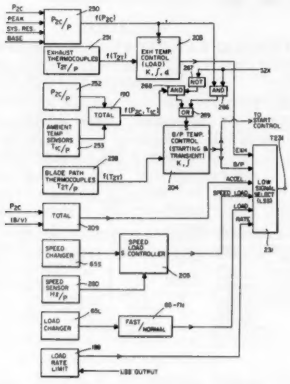
U.S. Cl. 290—40 **5 Claims**

1. A gas turbine electric power plant including a gas turbine having a compressor, combustion and turbine elements, a generator coupled to said gas turbine for drive power, a generator breaker for coupling said generator to a power system, a fuel system for supplying fuel to said gas turbine combustion

element, and a shutdown system for shutting down the operation of said gas turbine, said shutdown system comprising:

a. a plurality of monitoring circuits, each having means for signaling the occurrence of a specified condition in the operation of said turbine requiring shutdown of same;

b. means for shutting down said turbine upon receiving a signal from one of said monitoring circuits;



c. means for enabling automatic restart of said turbine after such a shutdown, when the condition causing shutdown is removed;

d. a count-down counter connected to each of said monitoring circuits such that it is counted down upon each occurrence which causes a shutdown;

e. a timer connected to said counter and adapted to reset said counter after a predetermined time period; and

f. means for disenabling said enabling means when said counter has counted down to a predetermined level.

3,924,142

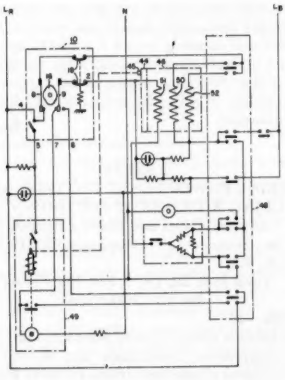
FAIL-SAFE CONTROL

Calvin J. Holtkamp, Mansfield, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed Apr. 11, 1974, Ser. No. 460,253

Int. Cl.² H05B *1/02*

U.S. Cl. 307—116 **12 Claims**



1. An oven control comprising:

a snap-action switch means adapted to be series connected to an oven heating means for directly controlling the energization of said oven heating means;

a bistable mechanism for controlling said snap-action switch means;

oven temperature responsive means acting upon said bistable mechanism to effect opening and closing of said snap-action switch means in accordance with oven temperature variations;

means for fail-safe operation of said control which are non-operative during normal operation of said temperature responsive means and upon failure of said oven temperature responsive means moves said snap-action switch means to an open position deenergizing said oven heating means.

3,924,143

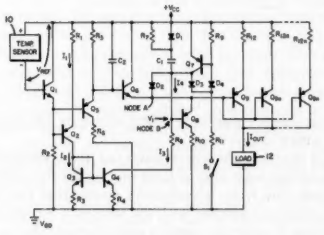
CONSTANT RISE TIME CONTROLLER FOR CURRENT PULSE

James M. Cunningham, St. Paul; Kenneth A. Dorn, Eagan; James A. Howe, Burnsville, and Charles L. Mortenson, Inver Grove Heights, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 527,978

Int. Cl.² H03K *5/12*

U.S. Cl. 307—263 **6 Claims**



1. In a controller for maintaining the rise time of the leading edge of an output pulse independently of the amplitude thereof, the combination comprising:

a first source of a constant amplitude first reference signal; a second source of a varying amplitude second reference signal coupled to said first reference signal for controlling said second reference signal to vary its amplitude with respect to said first reference signal;

a plurality of load transistors, each having a control electrode and a pair of output electrodes, having directly intercoupled control electrodes forming a first node, means coupling each separate first output electrode to said first reference signal and having directly intercoupled second output electrodes;

load means coupled to the directly intercoupled second output electrodes of said load transistors;

a current-mirror circuit including first and second transistors, each having a control electrode and a pair of output electrodes, with their control electrodes directly intercoupled, and the first output electrode of said first transistor directly coupled to said directly intercoupled control electrodes;

a rise time control circuit including first and second branches:

said first branch including a third transistor, having a control electrode and a pair of output electrodes for coupling said second reference signal to the first output electrode of said first transistor and generating an amplified first current signal whose amplitude varies as the amplitude of said second reference signal;

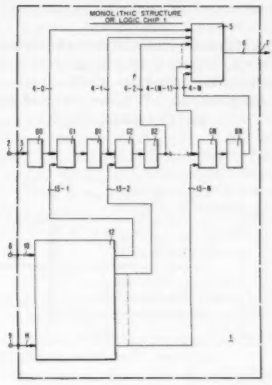
said second branch including serial coupled first capacitor means and first resistor means coupling said first reference signal to the first output electrode of said second transistor and a second node formed intermediate said first capacitor means and said first resistor means;

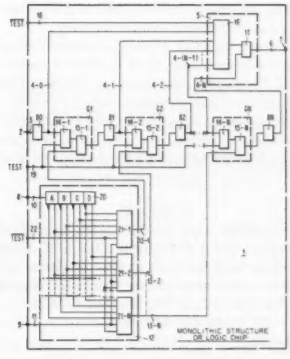
a fourth transistor, having a control electrode and a pair of output electrodes, means for directly coupling its first output electrode to said first reference signal, means for directly coupling its second output electrode to said second node and means including a first diode means for coupling its second output electrode to said first node;

switch means coupled to the control electrode of said fourth transistor and normally keeping said fourth transistor in its conducting state for substantially shorting said second node to said first reference signal as a second current signal flows through the junction of its first and second output electrodes when said fourth transistor is in its normally conducting state or for alternatively charging said first capacitor means at a constant rise time irrespective of the amplitude of said second current signal when said fourth transistor is switched into its non-conducting state.

a single output pin; and

gating means for transmitting to said single output pin the





output pattern provided by said selected logic block in response to the input test pattern applied thereto.

3,924,144

METHOD FOR TESTING LOGIC CHIPS AND LOGIC CHIPS ADAPTED THEREFOR

Gilbert Hadamard, Saint Jeannet, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,333

Claims priority, application France, May 11, 1973, 73.17606

Int. Cl.[2] G01R 15/12

U.S. Cl. 307—303 **8 Claims**

1. A logic chip having high circuit density and wherein said circuitry is arranged and adapted to facilitate testing, said logic chip including:

several functional logic blocks exhibiting a high degree of testability;

a logic block selection input pin;

decoding means responsive to the application thereto via said logic block selection input pin of the address of a given logic block to select said logic block;

a test pattern input pin;

connection means for applying an input test pattern entered via said test pattern input pin to said selected logic block;

3,924,145

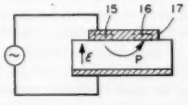
SURFACE WAVE DEVICE HAVING A FERROELECTRIC SUBSTRATE WITH A SINUSOIDAL POLE REGION

Robert Kansy, Fort Wayne, Ind., assignor to University of Illinois Foundation, Champaigne, Ill.

Filed Jan. 2, 1974, Ser. No. 430,030

Int. Cl.[2] H01L 41/04

U.S. Cl. 310—9.5 **3 Claims**



1. A surface wave transducer device comprising:

an unpoled ferroelectric substrate having a substantially sinusoidal poled region at a surface thereof;

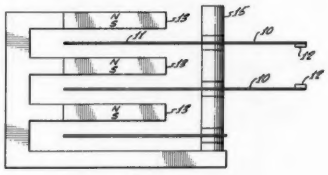
a metal plate electrode disposed over said poled region; and a second metal electrode disposed on the opposing surface of said substrate.

3,924,146

MULTIPLE LINEAR MOTOR POSITIONING SYSTEM

David J. George, Irvine, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.

Filed Jan. 27, 1975, Ser. No. 544,300
Int. Cl.[2] H02K *33/18*
U.S. Cl. 310—36 1 Claim



1. A magnetic head positioning system comprising:

a column comprised of a plurality of permanent magnetic slabs, each of said slabs to be positioned to have the plane of its surfaces parallel to the plane of the surfaces of each of said other permanent magnetic slabs;

means for separating each of said permanent magnetic slabs from each adjacent slab so as to form a comb;

at least one conductor positioned in the gap between two adjacent slabs of said comb;

a head arm assembly attached to said conductor; and

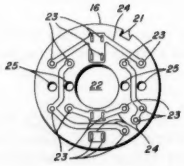
journal means for mounting said head arm assembly to permit a circular motion of said head arm assembly.

3,924,147

BRUSHHOLDERS AND ANCILLARY COMPONENTS MOUNTED ON A PRINTED CIRCUIT BOARD

Virgil K. Tarnow, and Kenneth E. Doshier, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Jan. 2, 1974, Ser. No. 429,751
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 7 Claims



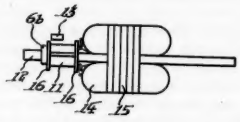
1. A motor sub-assembly comprising an insulating plate, a current conducting metal surface on a first side of said plate, a current conducting brushholder adjacent a second side of said plate and adapted to receive and guide a brush, a projection integral with said brushholder and extending through the insulating plate to said current conducting surface, a noise suppressor adjacent said second side, a conductor from the noise suppressor to said current conducting surface, and soldered connections rigidly joining the projection and said conductor to the conducting surface, said soldered connections retaining the brushholder and said noise suppressor on said plate and conducting current between the conducting surface and the respective projection and conductor.

3,924,148

SMALL SIZE DC MOTORS

Kan-ichi Tachibana; Michihiro Nishioka, and Mikiya Ono, all of Kitakyushu, Japan, assignors to Mitsubishi Mining & Cement Company Ltd., Tokyo, Japan

Filed Nov. 1, 1973, Ser. No. 411,715
Claims priority, application Japan, Nov. 15, 1972, 47-113840
Int. Cl.[2] H02H *7/08;* H02K *13/06;* H01R *39/46*
U.S. Cl. 310—220 1 Claim



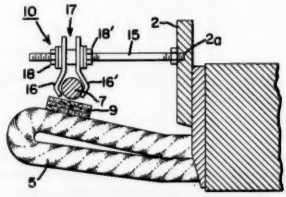
1. A small size DC motor comprising a commutator composed of a cylinder-shaped oxide sintered body having a barrier resistance at its surface, said oxide sintered body having negative resistance and also possessing the resistivity $R_0 K\Omega$cm at 273°K and the thermistor constant $B°K$ that satisfy the relation $R_0 X B$ 10,000 $K\Omega$cm.°K, and metal or alloy pieces attached to the plural points of the surface of said cylinder-shaped oxide sintered body respectively, said metal or alloy pieces being highly anticorrosive and having a high electric conductivity.

3,924,149

TIELESS BRACING AND METHOD FOR SUPPORTING END TURNS OF A DYNAMOELECTRIC MACHINE

Luis Alberto Estrada, and Warren Pierce Wielt, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,687
Int. Cl.[2] H02K *3/46*
U.S. Cl. 310—260 5 Claims



1. Tieless bracing means for winding end turns of a dynamoelectric machine comprising a radially expandable and contractable split metal annulus, adjustable take-up means mounted on said annulus, said take-up means being manually adjustable to move the ends of said annulus toward one another, an elongated tongue member mounted on the inner side of one end of the split annulus and disposed to engage and underlie the inner side of the other end of the annulus when said ends are moved within one inch of one another by the take-up means, a ring of compressible felt positioned in engagement with the inner side of said annulus around substantially the entire circumference thereof, in combination with a dynamoelectric machine frame having a stator mounted therein with insulated winding end turns extending beyond the stator ends, and a plurality of axially adjustable annulus positioning means mounted on said frame at arcuately spaced-apart points radially outward from the end turns, each of said annulus positioning means comprising:

a. a threaded stud mounted on the frame with its longitudinal axis generally parallel to the stator axis,

b. a pair of arms mounted in movable relation to one another on each stud adjacent the outer end thereof, said arms being operable to hold the annulus in a variety of pre-determined positions,

c. clamping means mounted on each stud, said clamping means being operable to move the arms in either direction along the stud thereby to locate the annulus in a desired one of said pre-determined positions with respect to the end turns, said clamping means being further operable to force the arms associated therewith together to secure the annulus held between them in said desired position while allowing the annulus to move radially relative to the elongated studs, and

dielectric means mounted on all but one of said threaded studs to insulate them respectively from the clamping means associated therewith, said one of the studs that does not mount one of the dielectric means being operable as an electrical grounding circuit between the annulus and the machine frame.

3,924,150
TURNABLE PHOTOTRANSDUCERS

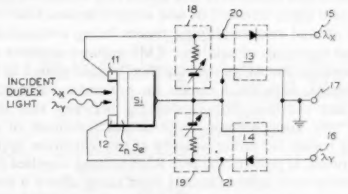
Kiyotaka Wasa, Nara; Fumio Hosomi, Higashiosaka, and Shigeru Hayakawa, Hirakota, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 315,825, Dec. 18, 1972, abandoned. This application June 20, 1974, Ser. No. 481,452

Claims priority, application Japan, Dec. 28, 1971, 47-134; Dec. 28, 1971, 47-135; June 14, 1972, 47-59921

Int. Cl.² H01L *31/10*

U.S. Cl. 307—311 **3 Claims**



1. A tunable phototransducer, comprising:

a heterojunction photodiode constituted by two layers of semiconductor material of the same type (p or n), one which has a small bandgap energy and is a base material, and the other of which has a large bandgap energy and is positioned on said base as a window material, said heterojunction photodiode generating a first voltage of one polarity in response to an incident light in a lower wavelength range of the photoresponse range thereof and also generating a second voltage of the opposite polarity in response to an incident light in an upper wavelength range of the photoresponse range thereof, wherein the generated first and second voltages have magnitudes in accordance with the relative intensities of the incident light;

a first metal electrode provided on said window material

a first high impedance variable bias source connected at one terminal thereof to said first metal electrode and at a base terminal thereof to said base material;

a first rectifier connected at a first terminal thereof to said one terminal of said first variable bias source, a second terminal of said first rectifier comprising a first output terminal of said phototransducer;

a second metal electrode provided on said window material and spaced apart from said first metal electrode, the area of said window material between said first metal electrode and said second metal electrode comprising means for receiving incident light;

a second high impedance variable bias source connected at one terminal thereof to said second metal electrode and at at base terminal thereof to said base material, said second variable bias source providing a bias voltage the same as that of said first variable bias source;

and a second rectifier connected at a first terminal thereof to said one terminal of said second variable bias source, a second terminal of said second rectifier comprising a second output terminal of said phototransducer, the rectifying property of said second rectifier as seen from said second output terminal being opposite to that of said first rectifier as seen from said first output terminal, whereby the output voltage between said first output terminal and said base material shows the existence and relative intensity of the incident light in the lower range of said photoresponse range, and the output voltage between said second output terminal and said base material shows the existence and relative intensity of the incident light in the upper range of said photoresponse range.

3,924,151
DELAY LINE WITH LOW REFLECTION ATTENUATION FOR TRANSIT-TIME TUBES

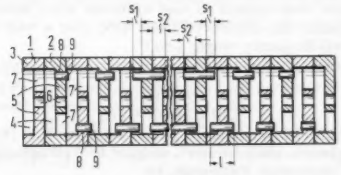
Franz Gross, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 6, 1974, Ser. No. 503,664

Claims priority, application Germany, Sept. 19, 1973, 2347209

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **2 Claims**



1. A delay line with low reflection attenuation for transit time tubes, particularly for amplification of millimeter waves, comprising a wave-guide having a plurality of successive transverse walls which form line cells, each of which have, in addition to a central opening for the passage of the electron beam, a coupling slot arranged alternately on opposite sides of the delay line, and a plurality of cylindrical attenuating bodies which project into the line cells with a penetration depth which varies uniformly along the course of the delay line for effecting a reflection-free attenuation, said transverse walls having recesses therein in which said attenutating bodies are respectively disposed in mechanically stable operative positions diametrically opposite to the cooperable coupling slots, the longitudinal axes of the cylindrical attenuating bodies and of the delay line being at least approximately parallel to one another.

3,924,152
ELECTRON BEAM AMPLIFIER TUBE WITH MISMATCHED CIRCUIT SEVER

Robert J. Butwell, Cupertino, and Gordon T. Hunter, Mountain View, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 4, 1974, Ser. No. 520,524

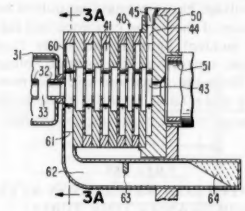
Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.6 **13 Claims**

1. An electron beam amplifier tube comprising; a vacuum envelope, means for forming and directing a beam of electrons, means for collecting said electrons, first circuit means for modulating said beam at a high frequency, second circuit means downstream of said first circuit means and isolated therefrom to prevent propagation of electromagnetic energy

therebetween, said second circuit means comprising, a slow-wave circuit capable of propagating a traveling wave in energy-exchanging relationship with said beam and having an upstream end adjacent said first circuit means and a downstream end removed from said upstream end in the direction of flow of said electrons,

an output transmission line matched to said downstream end of said slow-wave circuit to couple into said transmission line a greater part of the wave energy flowing in said



slow-wave circuit toward said downstream end, and terminating means at said upstream end of said slow-wave circuit, the improvement wherein,

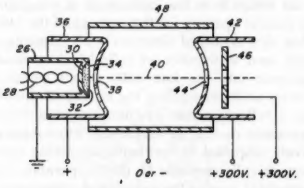
said terminating means comprises means for reflecting into a downstream flowing wave a selected substantial portion of wave energy flowing upstream in said slow wave circuit toward said upstream end, the reflected wave having a phase with respect to said upstream wave selected to increase the efficiency of said tube over a wide operational frequency range.

3,924,153

ELECTRON GUN

James L. McIntyre, deceased, late of Big Flats, N.Y. (by Betty J. McIntyre, administrator), assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1974, Ser. No. 450,275
Int. Cl.[2] H01J *29/46, 29/56*
U.S. Cl. 315—14 **7 Claims**



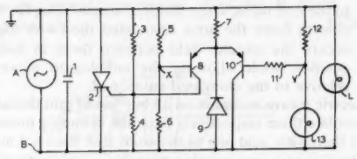
1. In a cathode ray tube, an electron gun structure comprising a cathode for emitting an electron beam, said cathode comprising a layer of an oxide having a smooth shaved surface from which electrons are emitted, a dish-shaped control grid having a central aperture through which electrons from said cathode can pass and in which the convex side of the dish-shaped grid faces said cathode, a dish-shaped accelerating anode spaced ahead of said control grid in the path of travel of said electrons from said cathode and having a central aperture at the bottom of its dish-shaped configuration through which electrons can pass, the concave side of the dish-shaped accelerating anode facing said control grid, a generally annular focus electrode surrounding said electron beam between the control grid and said accelerating anode, means connecting said cathode to ground potential, means for applying a positive potential to said control grid and said accelerating anode, and means for applying to said focusing electrode a potential ranging from zero to a negative potential.

3,924,154

VOLTAGE REGULATOR FOR ALTERNATING CURRENT LIGHTING SYSTEM

Floyd M. Minks, Rte. No. 1, Box 66, Kissimmee, Fla. 32741

Filed Nov. 21, 1973, Ser. No. 417,773
Int. Cl.[2] B60Q *1/08;* **G05F** *1/44*
U.S. Cl. 315—78 **9 Claims**



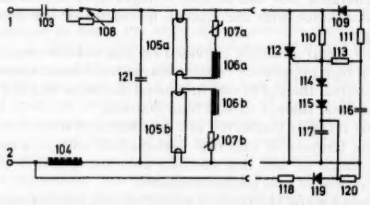
1. In a lighting system for use with an AC power producing source the frequency voltage, amplitude and waveform of which vary from time to time and having lighting means connected to be energized by the AC power supplied from said source: a voltage sensitive network having terminals connected to be energized by the waveform of said source and having output terminals producing a signal dependent upon the true RMS voltage value of said source; control means connected to control the flow of AC power from said source to said lighting means and having an input means; two amplifying means each having an input terminal, an output terminal, and a common input-output terminal, the common input-output terminals of said amplifying means being connected together, the output terminal of one amplifying means supplying power to said input terminal of said control means; said input terminals of said two amplifying means being connected to said output terminals of said true RMS voltage sensitive network to regulate the AC power supplied by said source to said lighting means; impedance means for preventing destructive voltages and currents from appearing between said input terminals and said common input-output terminals of said amplifying means for either polarity of the waveform applied to said network to prevent the true RMS voltage supplied from said source to said lighting means from rising above a preselected value; and means to make said network slightly more sensitive to one polarity portion of the waveform of said source than to the other polarity portion.

3,924,155

BALLAST UNIT FOR GAS DISCHARGE LAMPS

Ernest Jakob Vogeli, Friesenbergstrasse 40, 8055 Zurich, Switzerland

Filed May 24, 1972, Ser. No. 256,452
Claims priority, application Austria, May 24, 1971, 4476/71; Switzerland, May 16, 1972, 7220/72
Int. Cl.[2] H05B *41/14*
U.S. Cl. 315—97 **21 Claims**



1. A ballast unit for gas discharge lamps having a pair of electrodes, comprising:

a choke means, exclusively for limiting the current to the lamp after lamp firing, connected in series with the lamp electrodes;

at least one semiconductor switching means, having a control electrode, for brief preheating of the filaments of the lamp at increased rated current, said switching means being connected in parallel with said lamp electrodes; and a control circuit means operating in response to an AC voltage supplied to said lamp electrodes and also connected to said control electrode for initially triggering said semiconductor means for a predetermined switch-on time during each half cycle of said AC voltage, to heat the filaments of the lamp with an effective current greater than normal rated current, as well as reducing the switch-on time during each half cycle until the lamp fires, and further increasing voltage peaks across the lamp for a predetermined preheating period prior to reaching ignition voltage, thereby avoiding cold-starting of the lamp; said control circuit means including:

a storage device capable of storing a charge corresponding to the voltage applied to the lamp;

a discharge resistor connected to said charge storage device; and

overvoltage peak means to cut off any overvoltage peaks.

3,924,156

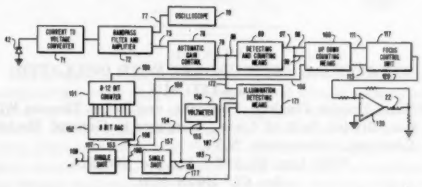
METHOD AND SYSTEM FOR CORRECTING AN ABERRATION OF A BEAM OF CHARGED PARTICLES

Samuel K. Doran, Wappingers Falls, and Merlyn H. Perkins, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1974, Ser. No. 483,266

Int. Cl.² H01J *29/70*

U.S. Cl. 315—382 **28 Claims**



1. A method for correcting an aberration of a beam of charged particles including:

directing the beam at a constant velocity in a predetermined path across a target during each cycle;

ascertaining the lengths of time for the beam to enter and leave at least one portion of the target;

and adjusting the aberration of the beam in accordance with the lengths of time for the beam to enter and leave the portion of the target in comparison with the lengths of time for the beam to enter and leave the portion of the target during the prior cycle of movement of the beam in its predetermined path.

3,924,157

COMPOSITION AND METHOD FOR ELECTRIFYING A GASEOUS ATMOSPHERE

John P. Peters, Marietta, and Larry H. McAmish, East Point, both of Ga., assignors to Lester Laboratories, Inc., East Point, Ga.

Filed Jan. 16, 1974, Ser. No. 433,985

Int. Cl.² B05B *5/00*

U.S. Cl. 317—3 **8 Claims**

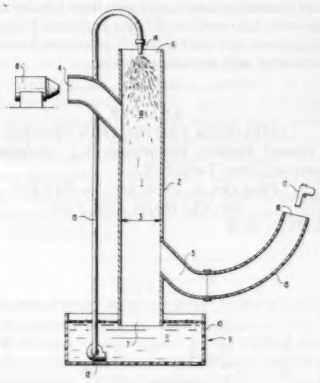
1. A process for imparting a positive electrical charge to a gaseous stream, said process comprising contacting said gaseous stream with an aqueous solution by spraying said aqueous solution into said gaseous stream, wherein said solution comprises about 500 – 3000 ppm of a composition consisting essentially of borax and a nonionic surfactant selected from the group consisting of:

a. a nonionic surfactant having an HLB number of 6.6,

b. a nonionic surfactant having an HLB number of 3.0,

c. a liquid, nonionic, fatty acid alkylolamide,

d. a nonionic polyethyleneoxide based, terminated alkyl aryl ether, and



e. a liquid, anionic, biodegradable, modified ethoxylate

for about 0.1 – 10 sec. at a temperature between about 15°C and the boiling point of said solution, the weight ratio of borax to surfactant in said solution being about 1.2:1 to about 15:1.

3,924,158

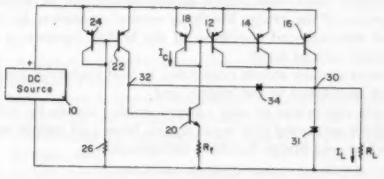
ELECTRONIC OVERLOAD PROTECTION DEVICE

Robert P. Farnsworth, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 24, 1974, Ser. No. 517,558

Int. Cl.² 323 *9*; **H02H** *3/24*

U.S. Cl. 317—31 **4 Claims**



1. An overload protection device adapted for coupling a direct current voltage source to a load so that load current is provided whenever the impedance of the load is greater than a preselected value and the load current is substantially interrupted whenever the impedance of the load is less than the preselected value, said device comprising:

a first current amplifier having an input signal terminal, and an output current path coupled between the voltage source and the load, said first current amplifier being responsive to signals applied to its input signal terminal for controlling the impedance of its output path from a minimum value to a maximum value, and including a plurality of transistors having their respective collector, emitter and base terminals interconnected and with the parallel combination of their collector-emitter current paths comprising said output current path, and another transistor which has its collector and base terminals connected to the interconnected base terminals of said plurality of transistors and to the input signal terminal of said first current amplifier, and its emitter terminal connected to the interconnected emitter terminals of said plurality of transistors; and

a second current amplifier having an input terminal coupled to said load such that its current gain is a function of the impedance of the load and having an output terminal coupled to the input signal terminal of said first current amplifier, and including means for controlling the collector current in said another transistor such that said plurality of transistors are biased into their saturated on condition when said load impedance is greater than said preselected value and are biased off when said load impedance is less than said preselected value.

3,924,159

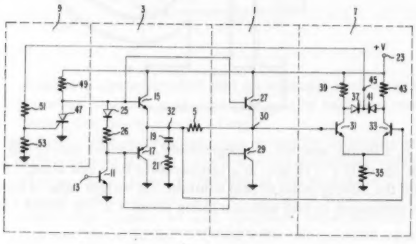
AMPLIFIER PROTECTION SYSTEM

Merle Vincent Hoover, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,225

Int. Cl.[2] H02H *3/08, 7/20*

U.S. Cl. 317—33 R **17 Claims**



14. A circuit for protecting the output stage of an amplifier from an overload condition comprising, in combination:

a protective amplifier stage having substantially the same operating characteristics for an identical input signal as said output stage forming a bridge with said output stage and connected to receive the same input signals as said output stage, said bridge having two nodes at opposite points of the bridge which, in normal operation, in view of the balanced condition of the bridge, operate at the same voltage levels;

current sensing means connected to said nodes for sensing an imbalance in the bridge, and

means responsive to said current sensing means for effectively removing said input signals from said output stage when said bridge becomes imbalanced.

3,924,160

CIRCUIT BREAKER WITH DETACHABLY CONNECTED FAULT SIMULATOR

Alfred E. Maier, Beaver Falls, and Alan B. Shimp, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 401,932, Sept. 28, 1973. This application July 25, 1974, Ser. No. 491,728

Int. Cl.[2] G01R *31/02*

U.S. Cl. 317—36 TD **9 Claims**

1. Circuit breaker apparatus, comprising;

A. separable main contacts operable to open and close on an electrical conductor to be protected thereby;

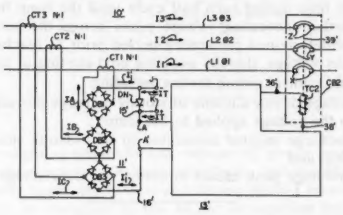
B. opening means operable for actuating said contacts to the open position;

C. a trip circuit interconnected with said opening means for causing operation thereof;

D. sensor means interconnected with said trip circuit and disposed to monitor the electrical current in said electrical conductor, said sensor means providing a signal to said trip circuit when said current in said conductor attains a predetermined value, said trip circuit causing the opening of said main contacts after a predetermined period of time which time is related to the amount of said electrical current in said conductor as monitored by said sensor;

E. an insulating housing; and

F. terminals disposed on said insulating housing and connected to said trip circuit, said terminals being detachably connected to an external fault simulator for providing a first simulating signal to said trip circuit at any desired time and regardless of the value of the current flowing



through said conductor, said latter signal simulating said signal from said sensor when said value of current flowing in said conductor is substantially larger than said predetermined value, and for providing a second simulating signal to said trip circuit at any desired time and regardless of the value of current flowing in said conductor, said latter signal simulating said signal from said sensor when said value of current flowing in said conductor is larger but not substantially larger than said predetermined value.

3,924,161

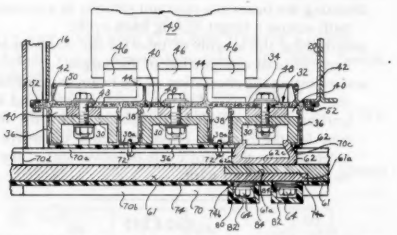
ELECTRICAL SWITCHBOARD WITH INSULATED, ISOLATED BUS

William Francis Olashaw, Plainville, and Roger Thomas Wilbur, Bristol, both of Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,526

Int. Cl.[2] H02B *1/20*

U.S. Cl. 317—120 **4 Claims**



1. An electrical switchboard having a plurality of compartments for accommodating electrical devices, said switchboard comprising, in combination:

A. a plurality of vertical busbars located just rearwardly of the switchboard compartments;

B. a plurality of horizontal busbars located rearwardly of said vertical busbars;

C. joints respectively electrically interconnecting each horizontal busbar to each vertical bus bar at intersections thereof, each joint secured by at least one bolt having a rearwardly accessible head;

D. individual, insulative caps removable mounted about said head of each said bolt to shield said bolt head;

E. insulative panels mounted fore and aft of said vertical busbars along their entire lengths to electrically and physically isolate said vertical busbars; and

F. insulative means including elongated insulative members forming individual channels shielding the upper and lower edges of said horizontal busbars accommodated therein, and insulative strips overlying the rearward surfaces of said horizontal busbars, thereby to electrically and physically isolate said horizontal busbars, wherein said insulative members are each L-shaped in cross-section and physically arranged in pairs to form said channels.

3,924,162

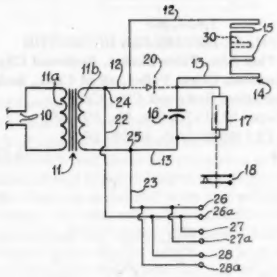
DEVICE FOR INTERRUPTING OR COMPLETING AN ELECTRIC CIRCUIT

Anthony J. Nocerino, 15 Bartow St., Staten Island, N.Y. 10308

Filed Aug. 12, 1974, Ser. No. 496,339

Int. Cl.² H01H *47/00*

U.S. Cl. 317—134 **10 Claims**



1. A device for interrupting or completing an electric circuit comprising a male plug and a disc shaped female socket, said socket having a diode for rectifying the voltage from said electric circuit after said voltage has been reduced, said plug being incorporated in said electric circuit and having a step-down transformer to reduce said electric current, a condenser for storing said reduced voltage after it has been rectified by said diode, and a relay coil for transmitting said reduced and rectified voltage to energize at least one contact therein such that said electric circuit is opened or closed.

3,924,163

DIRECTION INDICATOR CONTROL CIRCUIT

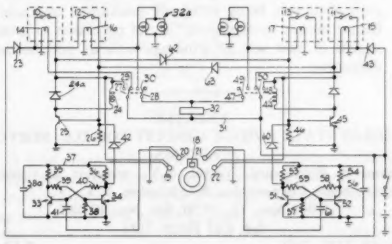
William David Holt, Colne, England, assignor to Lucas Electrical Co. Ltd., Birmingham, England

Filed Mar. 11, 1974, Ser. No. 450,005

Claims priority, application United Kingdom, Mar. 22, 1973, 13785/73

Int. Cl.² B60Q *1/42*

U.S. Cl. 317—148.5 R **5 Claims**



1. A direction indicator control circuit for use in a road vehicle having a steering mechanism, comprising first and second indicator means, first and second relays electrically associated with said first and second indicator means, respectively, for controlling the energization of said first and second indicator means, manually operable switch means associated with each relay for causing energization of the coil of the associated relay, first semi-conductor switch means connected to said first relay for controlling the energization of said first relay, means connected to said first semi-conductor switching means and responsive to movement of the vehicle steering mechanism in one angular direction towards its central position for controlling the conductive condition of said first semi-conductor switching means, second semi-conductor switching means connected to said second relay for controlling the energization of said second relay, and means connected to said second semi-conductor switching means and responsive to movement of the vehicle steering mechanism in the opposite angular direction towards said central position for controlling the conductive condition of said second semi-conductor switching means.

3,924,164

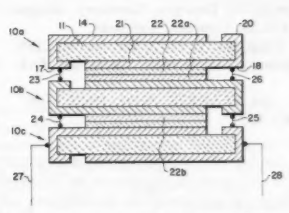
HIGH TEMPERATURE BERYLLIUM OXIDE CAPACITOR

Russell A. Lindberg, Westlake, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Jan. 28, 1975, Ser. No. 544,611

Int. Cl.² H01G *4/12, 1/01*

U.S. Cl. 317—258 **9 Claims**



1. A high temperature capacitor comprising

a platelet of BeO;

a first electrode sputter bonded to one side of said platelet, which side has a surface texture ratio of from about 5 to 7 produced by off-sputtering, said electrode being of Iridium; and

a second electrode sputter bonded to the other side of said platelet, which other side has a surface texture ratio of from about 5 to 7 produced by off-sputtering, said second electrode being of Iridium.

3,924,165

CONTROL CIRCUIT FOR SEQUENTIAL ENERGIZATION OF PLURAL LOADS FROM AN AC POWER SOURCE

Carl L. Otto, Jr., deceased, late of Lummi Island, Wash., by Phyllis Lockwood, executrix, Lummi Island, Wash. 98262

Continuation-in-part of Ser. No. 227,075, Feb. 17, 1972, Pat. No. 3,824,852. This application May 10, 1974, Ser. No. 468,906

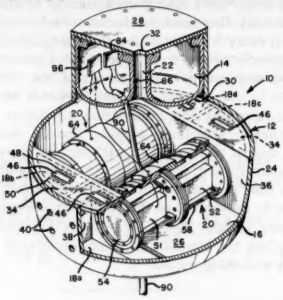
Int. Cl.² H02K *33/00*

U.S. Cl. 318—132 **11 Claims**

1. A circuit for distributing successive half waves of an alternating current power source to a plurality of loads, said circuit comprising:

a. a plurality of electronic check valve means, each being connected in series with a respective load and connected to a source of alternating current power so that each check valve means passes current only during one set of either positive or negative half cycles of the alternating current,

b. a plurality of gating means, each being connected to gate a respective check valve of one load and being operatively connected with another of said loads so as to receive its gating power therefrom, and



c. a plurality of gating delay means, each operatively connected to a respective gating means and arranged to block operation thereof at least during the half cycle of power of like polarity following the half cycle on which the respective gating means operates to pass power to its associated load.

3,924,166

SPEED CONTROL SYSTEM FOR LOW SPEED BRUSHLESS D-C MOTORS

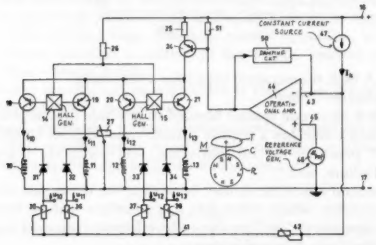
Benno Doemen, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Filed Oct. 1, 1973, Ser. No. 402,259

Claims priority, application Germany, Oct. 19, 1972, 2251292

Int. Cl.[2] H02K *29/02;* **H02P** *5/06*

U.S. Cl. 318—138 **21 Claims**



1. Brushless d-c motor (M) and speed control combination system in which the motor (M) has a permanent magnet rotor (R) and stator armature windings (**10–13**), comprising

controlled commutating switches (**18–21**) connected in a supply circuit to respective armature windings of the motor;

diodes (**31–34**) having one terminal each coupled to respective armature windings (**10–13**) and deriving sensed undulating d-c signals representative of voltages (FIGS. 2: u_{10}, u_{11}, u_{12}, u_{13}) induced in the stator armature windings (**10–13**) upon passage of the permanent magnetic rotor (R) past said windings during the interval when said armature windings carry no current due to blocking of supply power to respective windings by respective ones of said switches;

the other terminals of the diodes (**31–34**) being connected to a common junction (**41**), said common junction having applied thereto a d-c voltage having an amplitude which is dependent on motor speed and a superimposed first a-c voltage (u_r) of non-sinusoidal wave shape, the frequency of which is likewise dependent on motor speed;

a first adder circuit (**35–38; 47**) connected to said diodes (**31–34**) and adding at least a portion of each of the instantaneous values of the sensed undulating d-c signal to thus obtain a second a-c voltage of non-sinusoidal wave shape, and of a phase which is opposite that of said first a-c voltage;

a second adder circuit (**42**) connected to said common junction (**41**) and having said second voltage connected thereto to superimpose or instantaneously, algebraically add said first and second voltages so that superimposed, or algebraically added output voltages will appear as an output signal (u_D) at the output (**43**) thereof;

and a speed control circuit (**24, 25; 44**) connected to said output (**43**), controlled by the superimposed added first and second a-c voltages forming the output signal (u_D) thereat, and having its control output connected to control energization of the controlled commutation switches (**18–21**).

3,924,167

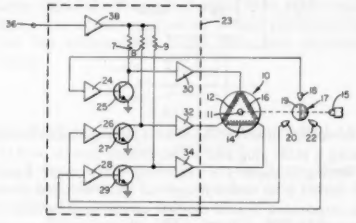
THREE PHASE BRUSHLESS DC MOTOR

Harold V. Clark, Palo Alto; Peter Skalon, Redwood City, and Lawrence D. Emmons, Grass Valley, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Sept. 17, 1973, Ser. No. 398,155

Int. Cl.[2] H02P *5/06;* **H02K** *29/02*

U.S. Cl. 318—254 **4 Claims**



1. A three phase brushless DC motor for precision servo applications, comprising,

a stationary armature having three sets of windings symmetrically positioned thereon;

a two pole permanent magnet rotor mounted for rotation relative to said armature;

photoelectric self commutation means including a square wave generation circuit connected to said sets of windings, half cone reflector means axially mounted to rotate with said rotor for reflecting light projected thereon by a source, a light source for projecting light on said half cone reflector means, three photodetectors connected to said circuit positioned symmetrically about said rotor so as to receive the reflected light, said reflector means and said photodetectors being relatively positioned and said reflector means having a 180° arc of reflection to produce signals in said sets of windings without odd harmonic distortion.

3,924,168

SOLID STATE BRIDGE CIRCUIT FOR D.C. SERVO SYSTEMS

Morton P. Woodward, Vestal, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Nov. 10, 1970, Ser. No. 88,407

Int. Cl.[2] H02P *7/28*

U.S. Cl. 318—257 **2 Claims**

1. In a solid state bridge circuit for a servo motor having a permanent magnet DC motor in the center of said bridge, four

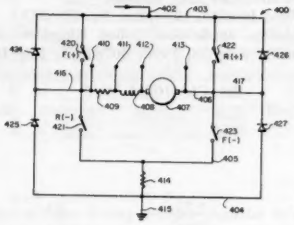
switching means as the arms of said bridge, and a ground and a power input connected to the other two ends of said bridge respectively, for controlling the direction and velocity of said motor, the improvement comprising:

a first resistor and an inductance in series with said motor in the center of said bridge;

a second resistor connected between said bridge and said ground;

first feedback means connected across said first resistor for motor current feedback;

second feedback means connected across said motor for motor velocity feedback;



third feedback means connected across said second resistor for motor current feedback; and

each of said switching means includes a switch and a diode, the switch and diode are connected in parallel for the two arms of said bridge between said input and said motor and the diode is in parallel with said switch and said second resistor for the two arms of said bridge between said ground and said motor, said diodes being connected so as to provide a current path to allow said inductor to continue current flow when only one of said switching means is closed and to allow current to flow from ground through the bridge into said power input when all of said switching means are open.

3,924,169

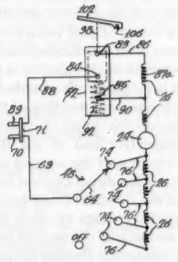
MIXER WITH SPEED CONTROL

Lewis John Craft, Villa Park; Leon M. Roszyk, Downers Grove; John M. Stipanuk, and Eugene B. Szymczak, both of Glen Ellyn, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 433,164

Int. Cl.[2] H02P *7/08*

U.S. Cl. 318—354 **10 Claims**



1. A food mixer with speed control comprising a housing, an electric motor mounted in said housing and adapted for driving food mixing means carried by said housing, and housing being provided with a handle portion, an electrical power and control circuit for said motor, a first multi-speed rotary switch for said motor connected in said circuit and having a plurality of speed positions, a second normally-open momentary switch connected in said circuit, said power and control circuit being characterized by a field coil assembly of said motor having a primary coil, a portion of which coil is adapted to be shorted out upon actuation of said second switch whereby to instantaneously increase the speed of said motor when said first rotary switch is in any one of said speed positions, a switch lever for said momentary switch pivotally mounted on said handle portion for downward actuating movement relative to said handle portion, vertically aligned longitudinally extending slots formed in the top surface of said handle portion and in said momentary switch lever, and a pivotally mounted control lever for said rotary switch which projects upwardly through said aligned slots for actuating movement forwardly and rearwardly therein.

3,924,170

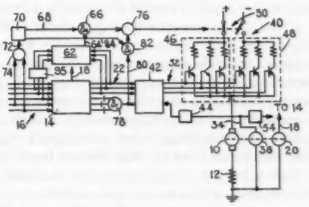
BANG-BANG SERVO SYSTEM

Alan Foster, Hitchin, England, assignor to International Computers Ltd., Hertfordshire, England

Filed July 31, 1973, Ser. No. 384,311

Int. Cl.[2] G05B *13/00*

U.S. Cl. 318—561 **1 Claim**



1. Servo control apparatus for a drive motor operable to drive a paper tractor, including:

a counter settable to register an initial digital count corresponding to a required paper tractor advance expressed as increments of movement distance;

means for progressively decrementing the count registered by the counter in response to accomplishment of increments of actual movement;

a motor drive current supply arranged to provide acceleration and deceleration drive current to the motor including a network of parallel current paths respectively arranged to provide current having a mutual binary power relationship and of opposite polarities, the polarities corresponding to acceleration and deceleration drive conditions respectively; and

control means including means arranged to respond to the count registered during the movement to produce control signals; a comparator responsive to the initial digital count and to the previously decremented registered count to produce, if the required advance is less than a predetermined magnitude, a first changeover signal when the registered count indicates that half the required advance has been completed; and a gating control arrangement effective, if the required advance is equal to said predetermined magnitude and if the required advance is greater than said predetermined magnitude, to disable the comparator and to produce a second changeover signal when the registered count indicates that a predetermined distance before completion of the advance has been reached, said control signals being operative to select the current paths in the network to be energized singly and in combination to provide a drive current of required magnitude and said first and second changeover signals being operative to alter the polarities of the drive current from an acceleration drive condition to a deceleration drive condition.

3,924,171
SERVO MOTOR CONTROL CIRCUIT

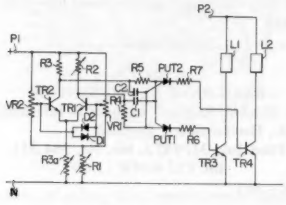
Takeshi Ukai, Tokyo; Masao Yaeshima, Sendai, and Kimio Watanabe, Iwanuma, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 395,175

Claims priority, application Japan, Sept. 13, 1972, 47-92056

Int. Cl.[2] G05B *1/06*; G05F *1/00*

U.S. Cl. 318—663 **4 Claims**



1. A servo motor control circuit comprising a bridge circuit including a first potentiometer having a slider which moves with a servo motor and a second potentiometer having a slider settable to select an angle of roatation of the servo motor, said first and second potentiometers being connected in parallel, a D.C. power supply having two terminals connected across the parallel combination of the potentiometers, means connected to said sliders for providing a pair of outputs representing together the difference between the voltage levels at the sliders, and a high sensitivity switching circuit including a pair of programmable unijunction transistors each having its anode and gate connected to one and the other of said outputs, respectively, in symmetrical relation with each other, said switching circuit causing rotation of the servo motor in a selected one of a forward and a reverse direction depending on the firing of selected one of the pair of programmable unijunction transistors, wherein said high sensitivity switching circuit further includes capacitor means for moderating oversensitivity thereof.

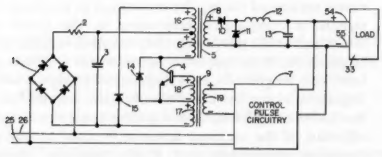
3,924,172
POWER SUPPLY

James M. Gregorich, Merrimack, N.H., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed July 11, 1974, Ser. No. 487,530

Int. Cl.[2] H02M *3/335*

U.S. Cl. 321—2 **9 Claims**



5. A circuit for converting voltage for driving a plurality of attached loads, said circuit comprising in combination:

first means for transforming voltage, said first means having two phases of operation, a first phase comprising simultaneously storing magnetic energy while directly driving said loads and a second phase comprising releasing said stored magnetic energy while indirectly driving said loads; and

second means connected in series to a primary winding of said first means for establishing the sequential, timed application of voltage to said first means, said timed application providing a period for the release of said stored magnetic energy; and

third means including a diode connected in series with a secondary winding of said first means providing a controlled path for the release of said stored magnetic energy.

3,924,173
COMMUTATION CIRCUITS IN INVERTER CIRCUITS

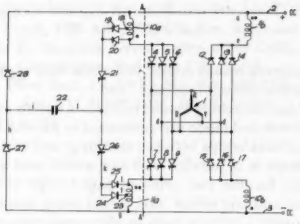
Sushil Kumar Goswami, 100 Ramton Road, Willingham, Cambridgeshire, CB4 5JO, England

Filed June 17, 1974, Ser. No. 480,253

Claims priority, application United Kingdom, June 28, 1973, 30781/73; June 28, 1973, 30782/73; July 10, 1973, 32773/73

Int. Cl.[2] H02M *7/515*

U.S. Cl. 321—5 **23 Claims**

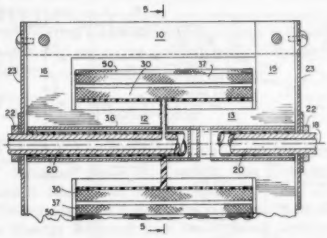


1. An inverter for supplying alternating current to a load from a direct current supply, including a controlled rectifier bridge which comprises a respective pair of first and second controlled rectifiers for connecting each A.C. supply terminal of the load to the positive and negative terminals of the direct current supply, the first controlled rectifier of each pair being connected to the positive supply terminal through at least part of a first inductor, and the second controlled rectifier of each pair being connected to the negative supply terminal through at least part of a second inductor, a flywheel diode bridge comprising a respective pair of flywheel diodes also for connecting each A.C. supply terminal of the load to the direct current supply terminals and a commutation circuit including a selectively dischargeable commutation capacitor for causing current to flow in one or other of said inductors and thereby to reverse bias so as to turn off a conducting one of the rectifiers connected thereto, wherein each inductor is provided with a second winding, which is magnetically coupled with the first winding of the inductor, the second winding of the first inductor being connected between the negative direct current supply terminal and the respective end of the flywheel diode bridge, and the second winding of the second inductor being connected between the positive direct current supply terminal and the respective end of the flywheel diode bridge, the polarity of the first and second windings of each inductor being such that when the first winding of the second inductor makes the thyristor bridge end connected thereto more positive than the negative supply potential, the second winding thereof makes the flywheel diode bridge end connected thereto less positive than the positive supply potential, and such that when the first winding of the first inductor makes the thyristor bridge end connected thereto less positive than the positive supply potential the second winding thereof makes the flywheel diode bridge end connected thereto more positive than the negative supply potential.

3,924,174
ROTARY POWER TRANSFORMER

Charles J. Fahrner, Park Ridge, Ill., assignor to Johnson Electric Coil Co., Elmhurst, Ill.

Filed Mar. 26, 1975, Ser. No. 562,029
Int. Cl.² H01F *39/00*
U.S. Cl. 323—53 **6 Claims**



1. A transformer having a ferro-magnetic laminated core including a leg having two aligned leg portions with an air gap therebetween, a cylindrical secondary winding structure positioned over said two leg portions and air gap so that it is rotatable about the same, a shaft within passages through said aligned leg portions and through said air gap and extending through passages in said magnetic core and beyond the core, means in said air gap securing said secondary winding structure to said shaft, said secondary winding having leads extending therefrom and passing radially in said air gap to said shaft, at least part of said shaft being hollow from said air gap region to an end of said shaft, said shaft at the region of said air gap having at least one opening through its wall to the interior thereof, said secondary winding leads extending through the shaft wall to the interior thereof and thence to the end of the hollow shaft portion for connection to a rotatable electric load, a stationary primary winding having a cylindrical interior surface disposed about said secondary winding and clearing the same to permit relative rotation thereof, both of said windings lying over the leg portions and air gap, means for retaining said core structure and primary winding rigidly in stationary position, bearing means supported by said stationary structure for rotatably supporting the shaft, said bearing means and support therefor having means for adjusting said shaft means to center the rotatable portions of the transformer for free rotation, whereby a relatively stationary electric power source may be metallically connected to the primary winding for energizing the same and the electric power in said secondary winding may be directly connected to a rotatable electric load without interposition of sliding contacts between relatively rotatable parts.

3,924,175
D.C. SYSTEM FOR CONDUCTIVITY MEASUREMENTS

Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation

Filed Feb. 28, 1974, Ser. No. 446,993
Int. Cl.² G01N *27/42*
U.S. Cl. 324—30 R **9 Claims**

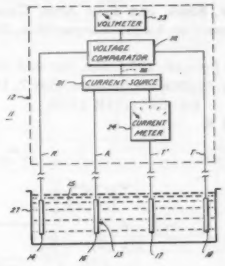
1. A d.c. system for measurement of conductivity of an electrolyte comprising:

a. four metallic electrodes immersible in the electrolyte, said electrodes disposed in a side-by-side alignment forming exterior and interior electrode pairs, one of the exterior or interior electrodes serving as reference electrodes for monitoring said electrodes' polarization potential, and respectively, the other of the interior or exterior electrodes providing auxiliary electrodes for passing current through the electrolyte for creating the polarization potential;

b. conductor means forming separate electrical circuits with said electrodes;

c. current source means for passing a measurable amount of direct current between said auxiliary electrodes for inducing an incremental change of predetermined magnitude in electrode potential between said reference electrodes;

d. potential measurement means connected to said reference electrodes for measurement of the incremental change in polarization potential therebetween;



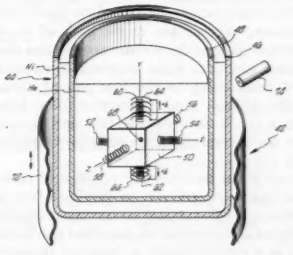
e. comparator means associated with said potential measurement means for controlling the current source means whereby a certain measurable amount of direct current passed between the auxiliary electrodes induces an incremental change of a predetermined magnitude between about 5 and 50 millivolts in electrode potential between said reference electrodes; and

f. readout means sensing the direct current passed between said auxiliary electrodes whereby the certain measurable amount of direct current is proportional to the conductivity of the electrolyte.

3,924,176
MAGNETOMETER USING SUPERCONDUCTING ROTATING BODY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Melvin M. Saffren, Altadena, and Daniel D. Elleman, La Canada, both of Calif.

Filed Nov. 11, 1974, Ser. No. 522,552
Int. Cl.² G01R *33/02*
U.S. Cl. 324—43 R **22 Claims**



1. A magnetometer for measuring the strength of a magnetic field comprising:

a body capable of becoming superconducting at a critical temperature;

means for maintaining the body at a temperature below the critical temperature;

means for supporting the body to permit free rotation of the body in response to the induced flow of superconducting current on the body by the magnetic field; and

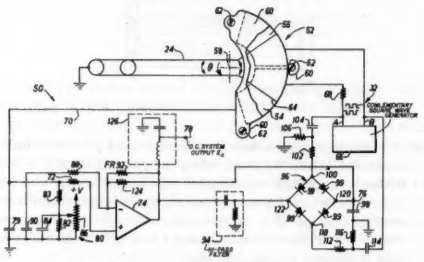
sensing means for determining the strength of the magnetic field as a function of the rate of rotation of the mass of the body.

3,924,177

TAPE LOOP TENSION ARM POSITION INDICATOR SYSTEM

Joseph Lemineur, Mons, and Rene Arys, Genappe, both of Belgium, assignors to Ampex Corporation, Redwood City, Calif.

Filed Feb. 25, 1974, Ser. No. 445,257
Claims priority, application Belgium, May 7, 1973, 130845
Int. Cl.² G01R *27/26*
U.S. Cl. 324—61 R **3 Claims**



1. For use in a tape transport, a tension arm position indicator system comprising:

a waveform generator generating first and second complementary square-wave signals;

a printed circuit board having a surface;

a tape loop tension arm disposed for rotation about an axis which is perpendicular to the surface, the tension arm having a conductive plate disposed for rotation therewith which is maintained at a fixed potential, the conductive plate being maintained parallel to and spaced a short distance apart from the surface of the printed circuit board as the tension arm rotates about the axis;

a pair of first capacitor plates, the first capacitor plates being coupled to receive the first and second complementary square-wave signals respectively and being formed as printed circuits on the surface of the printed circuit board in opposing relationship to the path of the tension arm conductive plate as the tension arm rotates about the axis; a second capacitor plate disposed in opposing, parallel spaced relationship to the first pair of capacitor plates with the tension arm conductive plate being movable within a space between the first and second capacitor plates, the second capacitor plate providing a first output signal;

a single amplifier which is AC coupled to receive the first output signal and generate an amplified first output signal and which is DC coupled to receive a tension arm position signal and generate an amplified tension arm position signal as a system output in response thereto; and

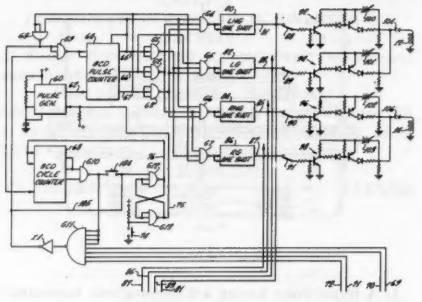
a phase detector coupled to compare the phase relationship of the amplified first output signal and the complementary square-wave signals and provide a tension arm position signal having a DC component with a magnitude dependent upon the magnitude of the amplified first output signal and a polarity dependent upon the relative phase relationships of the amplified first output signal and the complementary square-wave signals.

3,924,178

RELAY TESTER

John Lockyer, Smithtown, and Thomas C. Cleary, Northport, both of N.Y., assignors to Deutsch Relays, Inc., E. Northport, N.Y.

Filed July 3, 1974, Ser. No. 485,332
Int. Cl.² G01R *31/02*
U.S. Cl. 324—28 R **12 Claims**



1. The method of testing a relay of the type having a latch coil that is energized to drive the relay to a latching state and a reset coil that is energized to drive the relay to a reset state and having means for retaining the relay in either of said states upon de-energization of the coils, said method comprising the steps of

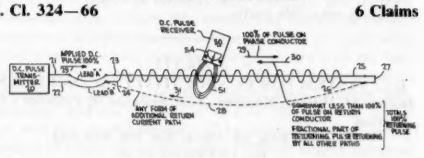
sequentially energizing each of said coils with a pattern of energizing pulses, said pulse pattern for energizing each of said coils comprising at least one pulse having a relatively small magnitude that is less than the magnitude nominally required to drive the relay from one of said states to the other and another pulse having a relatively large magnitude that is at least equal to the magnitude nominally required to drive the relay from one of said states to the other, and monitoring the state achieved by the relay in response to application of said relatively small pulse and in response to application of said relatively large pulse.

3,924,179

METHOD FOR CERTIFYING DEAD CABLES OR CONDUCTORS BY DETERMINING CURRENT PULSE POLARITY

William A. Dozier, c/o Georgia Power Company, P.O. Box 1220, Columbus, Ga. 31902

Filed Apr. 24, 1974, Ser. No. 463,683
Int. Cl.² G01R *19/14, 31/02*
U.S. Cl. 324—66 **6 Claims**



1. A method for certifying that an insulated electrical conductor is dead at a point remote from the two ends at which end points it is known to be dead and wherein at least one energized and/or AC current carrying conductor is present at the remote point comprising the steps of:

electrically connecting a conductor to be certified to an electrical return path at one of said end points;

supplying a periodic DC current pulse at the other of said end points between said conductor to be certified and said return path to generate therein a net DC current

pulse of the same polarity at said remote point along said conductor to be certified, a portion of said current pulse being returned along said electrical return path and the remaining portion of the current pulse being returned through an additional return path;

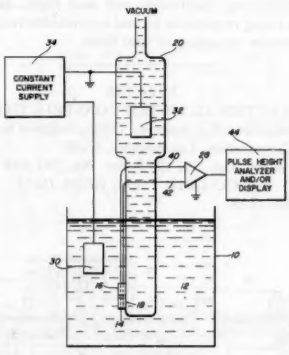
measuring the vector summation of all the currents in said electrical conductor to be certified and said electrical return path and thereby determining the polarity of the net DC pulse in the conductor to be certified at said remote point; and

determining that said electrical conductor is dead by ensuring that said measured polarity is the same as said same polarity.

3,924,180
POTENTIAL SENSING CELL ANALYZER

Gary C. Salzman; James R. Coulter; Paul F. Mullaney, and Richard D. Hiebert, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 12, 1973, Ser. No. 406,053
Int. Cl.² G01N *27/00*; **G01R** *27/14*
U.S. Cl. 324—71 CP **6 Claims**



1. A cell sensing apparatus comprising:

first container means for retaining a volume of liquid solution in which cells are suspended;

second container means partially disposed within said first container means;

means comprising a walled orifice through which said cell suspending liquid may be drawn from said first container means into said second container means, said walled orifice comprising a first layer of insulating material, a first electrode, a second layer of insulating material, a second electrode, and a third layer of insulating material, each of said layers and electrodes having a concentrically aligned aperture, said aperture being of sufficient diameter to allow passage therethrough of said cells;

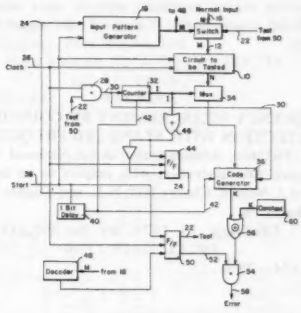
a constant current supply;

a third and fourth electrode means connected to said supply means for sensing a change in the potential difference between said first and second electrodes caused by at least one cell passing through the orifice, indicating the presence of said cell within said orifice.

3,924,181
TEST CIRCUITRY EMPLOYING A CYCLIC CODE GENERATOR

Gary E. Alderson, Play del Rey, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 16, 1973, Ser. No. 406,985
Int. Cl.² G01R *15/12*
U.S. Cl. 324—73 R **1 Claim**



1. Test circuitry adaptable for integration with a circuit having a M-bit input and N-bit output to be tested, said test circuitry and said circuit forming a single replaceable unit within a larger hardware system and comprising:

means for providing a predetermined sequence of T-Test patterns, each of M-bits for application to said M-bit input;

a parallel to serial multiplexer for converting the M-bits of circuit output to a single serial bit stream;

a cyclic code generator responsive to the serial output of said multiplexer for encoding a single K-bit number representative of T successive N-bit output patterns from said circuit, K being equal to or greater than 4 and less than T times N;

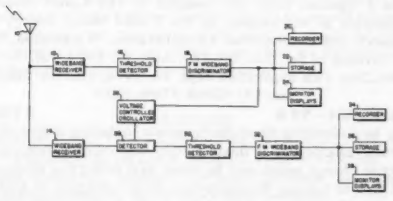
a hardwired constant representative of the output from a good circuit; and

a comparator for comparing said K-bit number with said hardwired constant.

3,924,182
SIGNAL ANALYZER

Garold K. Jensen, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1967, Ser. No. 614,528
Int. Cl.² G01R *23/02*, *23/18*
U.S. Cl. 324—77 R **4 Claims**



1. An signal analyzer comprising:

a signal source producing a signal to be analyzed;

first analyzing means connected to said signal source and including a first FM wideband discriminator for analyzing said signal to be analyzed;

a voltage controlled oscillator connected to be controlled by said first FM wideband discriminator and producing an oscillator signal and

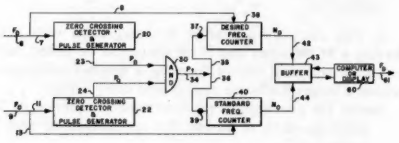
second analyzing means connected to said signal source and to said voltage controlled oscillator and including a second FM wideband discriminator for combining and for analyzing the combination of said oscillator signal and said signal to be analyzed

whereby said first analyzing means produces analytic data related to said signal to be analyzed and said second analyzing means produces analytic data related to the sideband components, if any, of said signal to be analyzed.

3,924,183
FREQUENCY MEASUREMENT BY COINCIDENCE DETECTION WITH STANDARD FREQUENCY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Edward J. Nossen, Cherry Hill, N.J., and Eugene R. Starner, Bethlehem, Pa.

Filed Sept. 13, 1974, Ser. No. 505,819
Int. Cl.[2] G01R *23/00*
U.S. Cl. 324—79 D **2 Claims**



1. A method of measuring a desired frequency F_D by comparing it to a standard frequency F_o, comprising:

detecting each zero-crossing of the desired frequency and generating a narrow pulse at each such zero-crossing,

detecting each zero-crossing of the standard frequency and generating a narrow pulse at each such zero-crossing,

gating the train of narrow pulses obtained from the desired frequency with the train of narrow pulses obtained from the standard frequency,

generating a coincidence pulse whenever said two trains of pulses are coincident,

applying consecutive pairs of coincidence pulses to start and stop a pair of counters, one to counter providing a count N_d of the desired frequency and the other counter providing a count N_o of the standard frequency, and obtaining F_D from $F_D = (N_d/N_o)F_o$.

3,924,184
VIBRATING FIBER ELECTROMETER

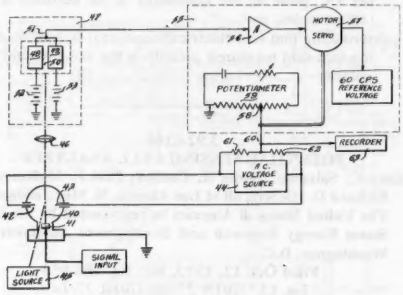
John J. Spokas, Lisle, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Division of Ser. No. 389,288, Aug. 17, 1973, Pat. No. 3,851,248. This application Sept. 16, 1974, Ser. No. 506,478
Int. Cl.[2] G01R *17/06, 5/28*
U.S. Cl. 324—99 R **4 Claims**

1. In a vibrating fiber electrometer including a pair of deflecting electrodes, a flexible fiber capable of carrying an electric charge positioned between said deflecting electrodes and free to vibrate therebetween, means coupled to said deflecting electrodes for applying a first alternating voltage thereacross, and means coupled to said fiber for applying a charge thereto, with said fiber having a charge thereon not equal to zero, said fiber being responsive to said first alternating voltage applied to said deflecting electrodes to vibrate therebetween, the improvement in said electrometer comprising:

a pair of oppositely biased photosensitive elements in spaced apart relationship and having a common electrode,

projection means responsive to the position of said fiber to project the image of said fiber so that with said fiber at rest said projected image is projected between said pair of photosensitive elements and with said fiber vibrating

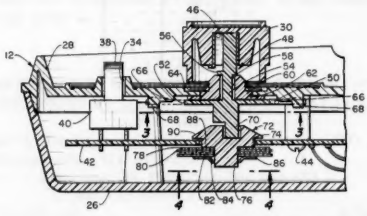


said projected image moves alternately across each of said photosensitive elements, said photosensitive elements in response to said motion of said image developing a second alternating voltage at said common electrode, and control means coupled to said common electrode, said deflecting electrodes and said fiber, said control means being responsive to said second alternating voltage to minimize vibration of said fiber.

3,924,185
ELECTRICAL METER CONSTRUCTION

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Aug. 30, 1973, Ser. No. 392,946
Int. Cl.[2] G01R *15/08;* **H01H** *19/58*
U.S. Cl. 324—115 **4 Claims**



1. In combination with an electrical meter apparatus, said electrical meter apparatus being mounted within a housing, said housing being connected with visual observation means for denoting various electrical readings, electronic circuitry mounted upon a printed circuit board, said printed circuit board located within said housing, said electrical circuitry connected to operate said visual observation means, said electronic circuitry including a plurality of separate circuit paths, the improvement comprising:

selector means connected to said housing and being movable to select an individual said circuit path of said plurality of separate circuit paths, said selector means including a plug rotatably mounted within an oversize opening within said printed circuit board, said plug capable of a limited amount of canting movement relative to said printed circuit board, an electrical contact element attached to said plug with a portion of said contact element to be in physical contact with said printed circuit board,

said portion comprising a spring, the force of said spring tending to maintain said plug axially aligned within said oversized opening;

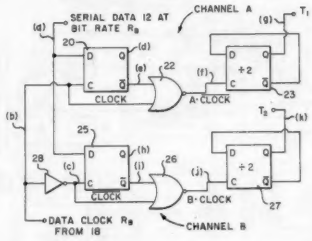
there being two in number of said electrical contact elements, said electrical contact elements being fixedly connected together so as to move together relative to said printed circuit board, said portions of said contact elements being aligned 180° apart; and

said selector means including a manually operatable knob located exteriorly of said housing, said knob being connected with a switch rotor, said switch rotor extending through an opening in said housing, a portion of said switch rotor cooperating in a loose fitting manner with a socket formed within said plug, a panel bushing located upon said switch rotor, said panel bushing being fixedly connected to said housing, said switch rotor being rotatable with respect to said panel bushing, the interconnection between said panel bushing and said switch rotor permitting a limited amount of canting movement of said switch rotor relative to said panel bushing.

3,924,186
STAGGERED QUADRIPHASE DIFFERENTIAL ENCODER AND DECODER

Robert S. Gordy, Largo; David E. Sanders, and Alfred T. Anderson, both of St. Petersburg, all of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 7, 1974, Ser. No. 548,133
Int. Cl.² H04B 1/00
U.S. Cl. 325—30 **17 Claims**



1. An encoder and decoder for use in a digital data transmission system for the encoding and decoding of a digital data signal wherein said encoder comprises:

a first and a second encoder channel wherein said digital data signal is alternately clocked thru said first and said second channel at staggered times by a clock signal and an inverted clock signal, respectively;

means in each of said channels for providing the complement signal of the digital signal present at a channel input upon the occurrence of a transition in a channel associated clock signal;

means in each of said channels for logically AND'ing the provided complement signal with the channel associated clock signal to provide an AND'ed signal;

means in each of said channels for dividing said AND'ed signal by a common factor to provide a channel encoded signal; and

wherein said decoder comprises:

a first and a second decoder channel wherein the one channel encoded signal is applied to said first decoder channel and the other channel encoded signal is applied to said second decoder channel;

means in each of said channels for delaying the respective channel encoded signal for a predetermined time interval;

means in each of said decoder channels for combining the delayed channel encoded signal with the undelayed channel encoded signal to provide a partially decoded signal;

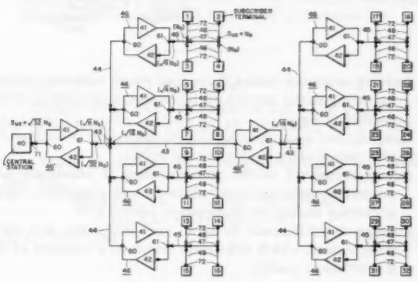
means in each of said decoder channels for gating said partially decoded signal as a function of a channel associated clock signal to provide a channel data signal; and

means for combining the channel data signal from each of said decoder channel gating means to provide a decoded digital data signal.

3,924,187
TWO-WAY CABLE TELEVISION SYSTEM WITH ENHANCED SIGNAL-TO-NOISE RATIO FOR UPSTREAM SIGNALS

Paul M. Dormans, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed May 14, 1974, Ser. No. 469,713
Int. Cl.² H04B 3/04
U.S. Cl. 325—52 **3 Claims**



1. A two-way cable television system for providing an enhanced signal-to-noise ratio for upstream signals comprising: a bidirectional signal transmission network for providing simultaneous downstream and upstream signal paths and having a single downstream source node in common with a single upstream sink node and a plurality of downstream sink nodes in common with a plurality of upstream source nodes; first signal generating and receiving means connected to the common downstream source node and upstream sink node for providing transmission of downstream signals and a master reference signal and for reception of upstream signals; second signal generating and receiving means connected to each one of the common downstream sink nodes and upstream source nodes for providing transmission of upstream signals and reception of downstream signals, each one of said second signal generating means having a predetermined and different time period for the transmission of the upstream signals which time period is commenced by said master reference signal; and gating means associated with one or more of the second signal generating and receiving means and inserted in series into the signal path of the signal transmission network and controlled by the signals therein for gating the last mentioned one or more second signal generating and receiving means to the upstream signal path during said time period of each one of said one or more second signal generating means whereby there is a selective reduction of the number of second signal generating and receiving means connected to the upstream signal path and the first signal receiving means.

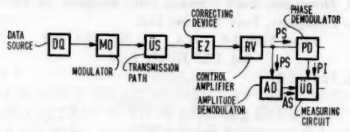
3,924,188
MEASURING THE TRANSMISSION QUALITY OF A PHASE DIFFERENCE MODULATED CARRIER

Rudolf Hofbauer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 6, 1974, Ser. No. 467,122
Claims priority, application Germany, May 4, 1973, 2322548
Int. Cl.² H04B 17/00; H04L 27/18
U.S. Cl. 325—67 **6 Claims**

1. In a data transmission system wherein message signals are transmitted using phase difference modulation in a pulse-con-

trolled manner and in consecutive modulation sections, said phase difference modulated carrier being subject to amplitude modulation by band limitation, wherein phase scanning pulses, occurring in the centers of consecutive modulation sections, are produced and wherein an amplitude demodulator produces an amplitude signal, modulation sections of said phase difference modulated carrier being assigned to modulation section of said amplitude signal, a method for measuring the quality of the transmitted signals, comprising:



deriving scanning pulses from said phase scanning pulses, occurring in the centers of the modulation sections of the amplitude signal,

sampling and measuring instantaneous values of said amplitude signal using said scanning pulses,

storing measured values corresponding to maximum and minimum instantaneous values of said amplitude signal occurring during an observation period and

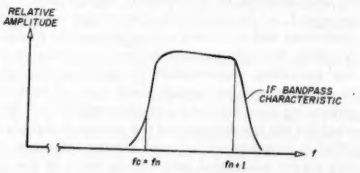
forming the difference between said maximum and minimum values, which difference serves as a measure of the transmission quality.

3,924,189

SYSTEM FOR DETERMINATION OF SMALL TUNING ERRORS IN RECEIVERS

Kenneth J. Campbell, 632 N. Granados St., Solana Beach, Calif. 92075

Filed Nov. 1, 1973, Ser. No. 411,963
Int. Cl.[2] H04B *17/00*
U.S. Cl. 325—363 **4 Claims**



1. A system for the determination of small tuning errors of SSB and CW receivers, comprising:

a receiver under test tunable to a plurality of discrete frequencies differing by an identical frequency separation between adjacent discrete frequencies, and having an IF bandpass at least equal to said frequency separation which is operative to produce an output at the separation frequency when the receiver is accurately tuned to any one of said plurality of discrete frequencies;

a source for producing signals of a frequency equal to said frequency separation;

a pulse generator connected to receive said signals and responsive thereto for developing pulses at the same frequency,

said pulses being impressed upon said receiver as its input signals;

frequency discriminating means connected to receive the output of said receiver for producing a signal as a function of the frequency deviation of the instantaneous output of said receiver relative to said predetermined frequency; and

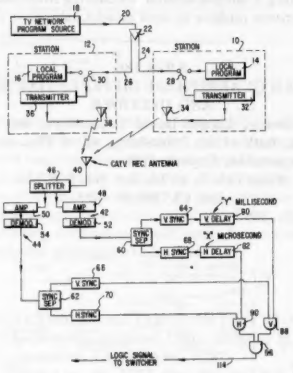
means for indicating the amplitude of the signal produced by said frequency discriminating means, whereby to determine the degree of tuning error of said receiver under test.

3,924,190

METHOD AND APPARATUS FOR AUTOMATIC PROGRAM CONTROL FOR CATV CHANNELS

William E. Roach, Banning, Calif., assignor to Storer Broadcasting Company, Miami Beach, Fla.

Filed Jan. 6, 1975, Ser. No. 539,020
Int. Cl.[2] H04H *1/04*; H04N *7/10*
U.S. Cl. 325—395 **19 Claims**



1. A method for controlling the distribution of signals for a cable television system which receives television signals from at least two signal sources wherein the signals from said respective sources received by the cable television system have a unique relative time differential only when the signal sources are simultaneously transmitting the same program which includes, sensing the presence of said unique relative time differential and preventing the distribution to the cable television system of signals from one of said signal sources when the presence of said unique time differential is sensed.

3,924,191

TOUCH-TUNING SYSTEM FOR A TELEVISION RECEIVER

Johnny Collins, Oak Park, and Melvin C. Hendrickson, Elmhurst, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

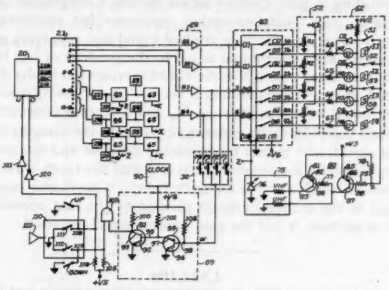
Filed Apr. 1, 1974, Ser. No. 457,021
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—464 **7 Claims**

1. An electronic touch-tuning system for a television receiver having a varactor tuner and a plurality of position switches individually associated with a corresponding plurality of tuning positions, comprising:

pulse driven switching means including a cyclical counter for sequentially transferring control of said varactor tuner among said tuning positions;

a pulse source; and

position seeking means coupling said switching means to said pulse source for transferring control of said tuner to



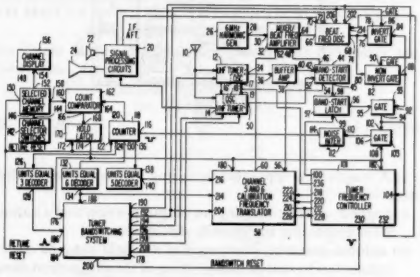
the tuning position associated with the actuated one of said position switches.

3,924,192

MULTIBAND RANDOM CHANNEL ADDRESS CRYSTAL-OCK TUNING SYSTEM

John Barrett George, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 476,081
Int. Cl.[2] H04B *1/32*
U.S. Cl. 325—470 **44 Claims**



1. A television tuning system comprising:

tuning means for receiving radio frequency signals corresponding to any one of a plurality of television channels in at least first and second bands of frequencies and having tunable local oscillator means for producing a corresponding oscillator signal in at least fourth and fifth bands of frequencies;

sweep generator means coupled to said oscillator means for varying the tuning thereof in a predetermined manner through at least said fourth and fifth bands of frequencies; signal generating means for producing reference signals at frequencies corresponding to television channel oscillator frequencies in said fourth and fifth bands;

frequency discriminator means having first and second inputs coupled to said oscillator means and to said signal generating means, respectively, for producing an output signal representative of frequency differences between said oscillator signal and each of said reference signals as said tuning is varied;

counting means coupled to said discriminator means for producing an output count representative of said oscillator signal passing through a predetermined frequency relationship with respect to each of said reference signals; channel selector means having an output terminal for producing at said output terminal a stored count representative of a selected television channel;

comparator means coupled to said counting means and to said channel selector means for providing a hold signal to said sweep generator means in response to a match between said output count and said stored count;

decoder means coupled to said counting means for identifying the presence of a particular output count;

bandswitch means for producing a band selection signal to condition said tuning means for reception of said first band of radio frequencies when said output count is less than or equal to said particular count and to condition said tuning means for reception of said second band of radio frequencies when said output count is greater than said particular count; and

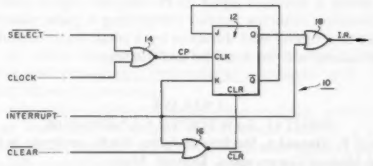
means for resetting said sweep generator means, in response to a match between said output count and said particular count and the absence of said hold signal, to a condition suitable for initiating variation of the tuning of said oscillator means through said fifth band of frequencies.

3,924,193

LOGIC CIRCUIT INCLUDING J-K FLIP FLOP PROVIDING OUTPUT PULSE IN RESPOSE TO LONGER DURATION INPUT PULSE

Sverre Wolff, Sunnyvale, Calif., assignor to Hycel, Inc., Houston, Tex.

Filed Oct. 29, 1974, Ser. No. 518,372
Int. Cl.[2] H03K *5/20, 19/12*
U.S. Cl. 328—109 **8 Claims**



1. A logic circuit for providing a request for service signal to servicing means in response to the occurrence of an event manifested by the occurrence of an event signal, said request signal being provided from the time said event occurs until the time said servicing means provides a signal indicating service is to occur, said circuit comprising:

bistable means having a true data input, a false data input, a clock input, a clear input, a true output and a false output, the signals provided by said true output and said false output being opposite in state, said false output being coupled to said true data input, the signal provided by said true output becoming a true state whenever a switching signal is applied to said clock input at the time a signal having a true state is applied to said true data input and a signal having a false state is applied to said false data input;

first means for applying said event signal as a false state signal to said false data input;

second means for applying said event signal to said clear input so that the trailing edge of said event signal causes said true output to provide a signal having a false state;

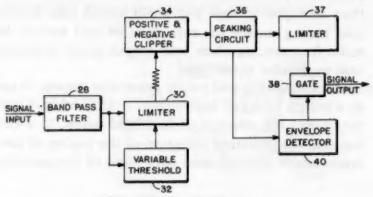
third means for providing said switching signal to said clock input in response to said servicing means providing said signal indicating service; and

gating means for providing said request signal whenever said event signal is provided and said true output provides a true state signal.

3,924,194
SIGNAL REGENERATOR

Charles W. Cook, Huntsville, Ala., assignor to Avco Corporation, Huntsville, Ala.

Division of Ser. No. 358,863, May 10, 1973, Pat. No. 3,863,031. This application Oct. 31, 1974, Ser. No. 519,733
Int. Cl.[2] H04B *1/04*
U.S. Cl. 328—164 **2 Claims**



1. A signal regenerator for a signal having a predetermined frequency and duration, the combination comprising:

a resonant circuit tuned to said frequency, said signal being applied to said resonant circuit;

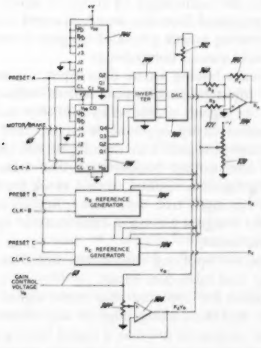
an AND gate having an output terminal and first and second input terminals, the signal output from said resonant circuit being applied to said first input terminal, said AND gate being enabled by an enabling pulse applied to said second input terminal; and

means for generating said enabling pulse, said enabling pulse having said predetermined duration, said means comprising an envelope detector, said signal output from said resonant circuit being applied to said envelope detector, said envelope detector developing a square wave having a duration equal to the applied signal, and said envelope detector further comprising a pulse shortener for shortening said duration by a small fixed amount to eliminate a fixed error in said duration.

3,924,195
DIGITAL SAWTOOTH GENERATOR

Michael F. Matouka, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 8, 1974, Ser. No. 458,562
Int. Cl. H03k *4/10, 3/37*
U.S. Cl. 328—181 **3 Claims**

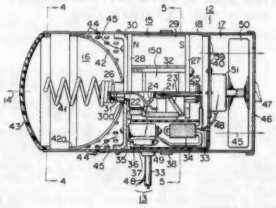


1. A digital sawtooth waveform generator comprising: means for generating a series of clock pulses; means for generating a series of recurring preset pulses; counting means for receiving said series of clock pulses and recurring preset pulses and counting said clock pulses between preset pulses to provide a digital signal representing the number of clock pulses counted thereby between preset pulses; means for generating a gain control signal having a magnitude V_G; a variable gain digital-to-analog converter for receiving the digital signal and the gain control signal and supplying a first signal having a magnitude equal to the product of V_G, N and a first constant where N is the count represented by the digital signal; means for generating a second signal having a magnitude equal to the product of V_G and a second constant, the second signal having a polarity opposite to the polarity of the first signal; and means for summing the first and second signals, whereby the summation is a digital sawtooth waveform which is compressed or expanded about a particular count N equal to the second constant divided by the first constant as the magnitude V_G of the gain control signal is varied.

3,924,196
HIGH FREQUENCY THERAPEUTIC APPARATUS

Hirokazu Takahashi, Tokyo, and Masao Kato, Komae, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 4, 1974, Ser. No. 448,013
Claims priority, application Japan, Mar. 7, 1973, 48-26189
Int. Cl.[2] H01J *21/18*
U.S. Cl. 328—253 **7 Claims**



1. A magnetron apparatus including a microwave oscillator comprising:

a magnetron device having an output portion and a cathode stem projecting in opposite directions;

an antenna assembly composed of a helical antenna directly connected to said output portion of the magnetron device and a microwave reflector reflecting in the form of a beam in a predetermined direction the microwave energy radiated from said antenna;

a shield case enclosing the magnetron device and the antenna assembly;

said microwave oscillator being connected electrically to a power supply with low frequency cord means;

the antenna assembly having a dielectric cover formed of dielectric material permeable to microwaves and fitted to the forward end of the shield case.

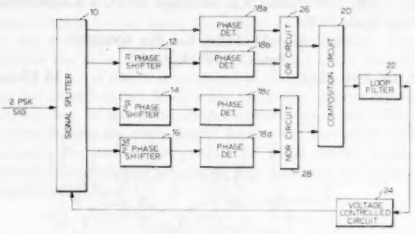
3,924,197
CIRCUIT FOR REPRODUCING REFERENCE CARRIER WAVE

Akira Okano; Yoichi Moritani, and Masahiro Murakami, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 427,099, Dec. 21, 1973, Pat. No. 3,886,462. This application Dec. 19, 1974, Ser. No. 534,343
Claims priority, application Japan, Dec. 27, 1972, 47-2506
Int. Cl.[2] H04L *27/22;* **H03B** *3/06*
U.S. Cl. 329—104 **4 Claims**

1. A circuit for reproducing a reference carrier wave for a 2-differential phase shift keyed signal, comprising, in combination, a signal splitter circuit for splitting a 2-differential phase shift keyed signal applied thereto into four signal por-

tions, phase shifter means for relatively shifting phases of said four signal portions so that, with respect to a selected one of said signal portions, the remaining three signal portions have phase shifts of π, $\pi/2$, and 3 $\pi/2$ radians, respectively, one phase detector for phase detecting each of the relative phase shifted signal portions, a pair of logic circuits each connected



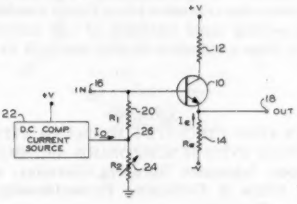
to one pair of the phase detectors producing detected outputs having a phase difference of π radians to switch said detected outputs with a predetermined threshold magnitude, a composition circuit for adding the outputs from said pair of logic circuits, a loop filter coupled to said composition circuit, and a voltage controlled oscillator coupled to said loop filter and to said signal splitter circuit to form a phase locked loop.

3,924,198

TRANSISTOR AMPLIFIER HAVING SINGLE CONTROL TO SIMULTANEOUSLY ADJUST INPUT RESISTANCE AND INPUT VOLTAGE LEVEL

Thor Oscar Hallen, Aloha, Oreg., assignor to Tektronix Inc., Beaverton, Oreg.

Filed Aug. 12, 1971, Ser. No. 171,244
Int. Cl.² H03F *3/04*
U.S. Cl. 330—32 **12 Claims**



1. A transistor amplifier in which the improvement comprises:

a transistor having emitter, base and collector electrodes;

bias means for applying a D.C. emitter bias current to said emitter and causing a D.C. base current flow in said base;

an emitter resistance connected to said emitter;

an input signal terminal directly connected to said base to provide a D.C. input signal path to said base;

a first base resistor connected at one terminal to said base; and

compensation means including resistance means connected between the other terminal of said first base resistor and a reference voltage for applying a D.C. compensation voltage to the other terminal of said first base resistor to compensate for the voltage drop produced across said first resistor by said base current;

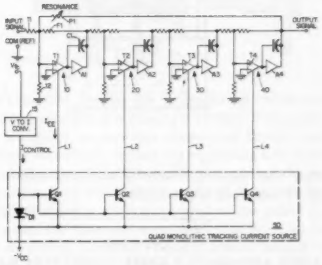
said compensation means including a single control means for adjusting said compensation voltage in order to maintain the D.C. voltage level of said input terminal at predetermined value, and for simultaneously varying the resistance in series between said first resistor and ground in order to maintain the input resistance of said amplifier at a predetermined value, in spite of different current gains for said transistor.

3,924,199

N-POLE FILTER CIRCUIT HAVING CASCADED FILTER SECTIONS

Alan R. Pearlman, Newton Highlands, Mass., assignor to ARP Instruments, Inc., Newton, Mass.

Filed Feb. 4, 1974, Ser. No. 439,353
Int. Cl.² H03F *1/36*
U.S. Cl. 330—107 **5 Claims**



1. An active low-pass filter having a selectable cutoff frequency and providing a controllable resonance peak in the vicinity thereof, comprising

A. n low-pass series-connected filter sections, each having an input and an output and characterized by a cutoff frequency selected by a control current applied thereto, each contributing a phrase shaft of $180/n$ degrees at resonance,

B. a current source responsive to control input applied thereto to provide a substantially identical control current to each filter section for selecting the cutoff frequency thereof, in accordance with said control input, and

C. a resistor interconnecting the output of a last of said filter with the input of a first thereof and adjustable to vary the resonance peak of the filter.

3,924,200

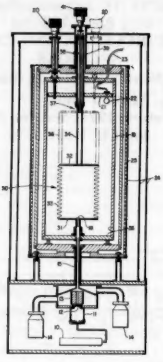
ATOMIC STANDARD WITH VARIABLE STORAGE VOLUME

Harry E. Peters, Seabrook, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Oct. 3, 1974, Ser. No. 511,887
Int. Cl.² H01S *1/00*
U.S. Cl. 331—94 **2 Claims**

2. In an atomic or molecular frequency standard of the type including a vacuum chamber enclosing a storage bulb, an arrangement comprising a storage bulb which has a constant surface area and a continuously adjustable volume, the volume of said bulb being adjustable by varying the length of said bulb along one axis; screw means extending through said vacuum chamber, one end of said screw means being attached to one end of said bulb, a rotary seal being formed between said screw means and said vacuum chamber, rotation of said

screw means from outside said vacuum chamber causing longitudinal movement of said one end of said bulb relative to



the other end thereof, whereby accurate adjustment of the volume of said bulb is provided.

3,924,201

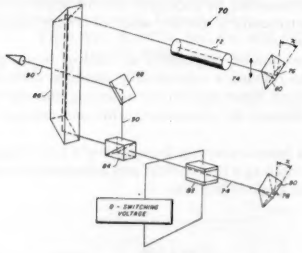
LASER APPARATUS EMPLOYING MECHANICAL STABILIZATION MEANS

Thomas G. Crow, Orlando, Fla., assignor to International Laser Systems, Inc., Orlando, Fla.

Continuation-in-part of Ser. No. 293,842, Oct. 2, 1972, abandoned. This application July 10, 1974, Ser. No. 487,121

Int. Cl.[2] H01S *3/08, 3/081*

U.S. Cl. 331—94.5 C **13 Claims**



1. Laser apparatus comprising:

an active laser medium;

means for producing a population inversion in said laser medium;

first and second roofline prisms disposed along said beam for stimulating and supporting the emission of a coherent beam of radiant energy from said laser medium;

a beam splitter for polarizing radiant energy along said beam into a plane of polarization and for directing a portion of said radiant energy along an output axis out of said beam splitter;

means for maintaining the rooflines of said prisms perpendicular to each other to render said laser apparatus relatively insensitive to mechanical tolerances, shock and vibrations;

means for positioning the rooflines fo said prisms at an angle with respect to said plane of polarization, which angle is substantially other than normal to or parallel with said plane of polarization and lying in a plane normal to the axis of said beam; and wherein

said angle is selected to provide a desired output from said beam splitter.

3,924,202

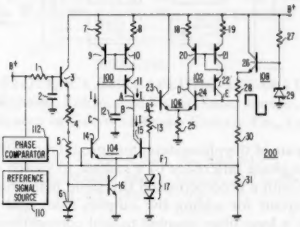
ELECTRONIC OSCILLATOR

Jack Craft, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,290

Int. Cl.[2] H03K *4/06*

U.S. Cl. 331—111 **13 Claims**



1. An oscillator circuit comprising:

a current source;

current steering means coupled to said current source and responsive thereto for providing first and second current paths;

a charge storage device coupled to one of said current paths;

current repeater means coupled to the other of said current paths and to said charge storage device, said current repeater means and said current steering means providing alternate charge and discharge paths for said charge storage device; and

regenerative switching means coupled to said charge storage device and responsive to the charge condition thereof for providing rapid transition of said current steering means from conduction in said one path to said other path.

3,924,203

MODULATOR CIRCUITS FOR TRANSLATING D.C. SIGNALS INTO SYNCHRONOUS A.C. SIGNALS

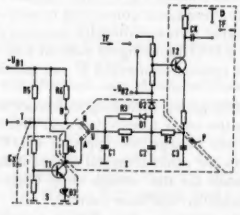
Hans Robert Schemmel, Nurnberg, Germany, assignor to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH, Nurnberg, Germany

Filed May 16, 1974, Ser. No. 470,553

Claims priority, application Germany, May 18, 1973, 2325191

Int. Cl.[2] H03K *7/00, 5/02*

U.S. Cl. 332—9 R **7 Claims**



1. A modulator for modulating an a.c. signal with a d.c. signal from a d.c. line, the modulator comprising a pulse shaping circuit having an input and an output; a modulating

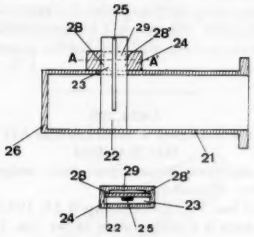
means having an input for a modulating signal, an input for the a.c. signal, and an output for a modulated a.c. signal, an inverter having an input and an output, and a switch means having two alternatively selectable contacts and a wiper contact, the d.c. line being connected to one of the alternatively selectable contacts and to the inverter input, the inverter output being connected to the other alternatively selectable contact, the wiper contact being connected to the pulse-shaping circuit input, the output of which is connected to the modulating signal input of the modulating means; wherein the pulse shaping circuit comprises a low pass filter having an input which is arranged to cooperate with the d.c. line for closed-circuit feed, when the switch means connects the d.c. line to the pulse shaper circuit input, and with the inverter output for open-circuit feed, when the switch means connects the inverter output to the pulse shaper input, to provide independently adjustable time constants for open-and closed-circuit feed.

3,924,204

WAVEGUIDE TO MICROSTRIP COUPLER

Michel Fache; Jacques Blondel, and Jean-Rene Mahieu, all of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed May 6, 1974, Ser. No. 467,235
Claims priority, application France, May 7, 1973, 73.16269
Int. Cl.² H01P *1/16, 5/08*
U.S. Cl. 333—21 R **3 Claims**



1. A broadband coupler between a rectangular waveguide and a microstrip line comprising a rectangular channel formed in a metal body fixed on a first large wall of said waveguide and perpendicular thereto with the largest dimension of said channel parallel to the axis of said waveguide, a rectangular dielectric substrate plate within said channel extending into said waveguide through a slot in said first wall up to the second large wall, a conductor printed on a first face of said dielectric plate extending into said waveguide, in which packing means are provided on one inner wall of said channel to support the second face of said dielectric plate so that the distance "e" between the inner wall and said second face of said plate has a range of values defined by

$$3\times10^{8}/f > e \geq 1.5\times10^{8}/f$$

where:

f is the midband frequency in hertz of the operating frequency band and

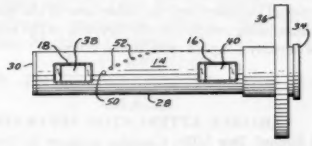
e is measured in meters.

3,924,205

CROSS-POLARIZED PARABOLIC ANTENNA

Laurence H. Hansen, Oak Lawn; Robert E. Massey, Oak Forest, and Aloysius Wojnowski, Worth, all of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Division of Ser. No. 454,814, March 26, 1974, Pat. No. 3,864,688, which is a continuation of Ser. No. 331,172, Feb. 9, 1973, abandoned, which is a continuation of Ser. No. 237,727, March 24, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,528
Int. Cl.² H01P *1/16, 5/12*
U.S. Cl. 333—21 A **5 Claims**



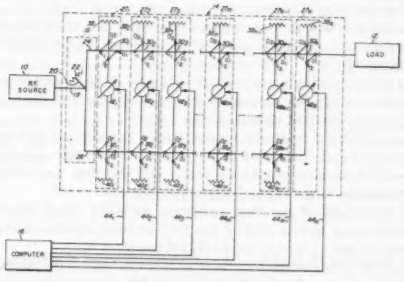
1. In a waveguide system for propagating crosspolarized high-frequency radiation comprising a circular waveguide and a pair of rectangular waveguides connected thereto and extending radially therefrom, means for supplying a first linearly polarized high frequency radiation signal to one of the rectangular waveguides, and means for supplying a second linearly polarized high frequency radiation signal to the other rectangular waveguide, the first and second signals being polarized in the same direction, the improvement characterized by the longer transverse H-plane dimension of both rectangular waveguides being aligned in a common plane at their points of connection to the circular waveguide, the circular waveguide having therein a 90° polarization rotator between the points of connection thereto of the respective rectangular waveguides for producing orthogonality of the first and second signals supplied to the circular waveguide through the rectangular waveguides, said polarization rotator comprising stationary passive conductor means.

3,924,206

RADIO FREQUENCY ATTENUATOR COMPRISING A PLURALITY OF VARIABLE PHASE SHIFTERS AND SERIALLY COUPLED DIRECTIONAL COUPLERS

Matthew Fassett, Billerica, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 21, 1974, Ser. No. 499,390
Int. Cl.² H01P *1/22*
U.S. Cl. 333—81 R **2 Claims**



1. A radio frequency attentuator for coupling a source of radio frequency energy to an output load with an amount of attenuation selected in accordance with signals provided by a control signal source, comprising:

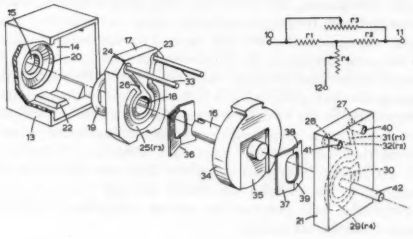
a. a first plurality of serially coupled directional couplers, the last one thereof being adapted for coupling to the output load;

b. a plurality of loads, each one thereof being coupled to a different one of the directional couplers;
c. a plurality of variable phase shifters, each one thereof being coupled to a different one of the directional couplers and to the control signal source;
d. a second plurality of directional couplers, each one thereof being coupled to a different one of the first plurality of directional couplers through a different one of the variable phase shifters; and
e. a power divider having an input terminal adapted for coupling to the source of radio frequency energy, and a pair of output terminals, one of such output terminals being coupled to the first one of the first plurality of serially coupled directional couplers and the other one of the pair of output terminals being coupled to the first one of the second plurality of serially coupled directional couplers.

3,924,207
VARIABLE ATTENUATOR APPARATUS

Arnold Simoni, Don Mills, Canada, assignor to Precision Electronics Components Ltd., Toronto, Canada

Filed Dec. 11, 1974, Ser. No. 531,517
Int. Cl.² H03H 7/26
U.S. Cl. 333—81 R **6 Claims**

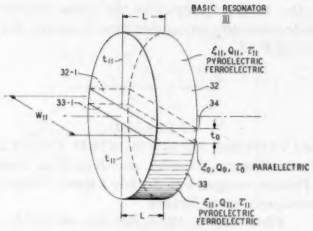


1. A variable attenuator apparatus comprising:
a housing;
a rotatable shaft extending inwardly of the housing;
first and second spaced-apart, stationary insulating substrate elements supported within the housing, one of said elements including a shaft-receiving aperture through which the rotatable shaft extends, each substrate element supporting a pair of first and second terminals, the first and second terminals of one pair being connected respectively to the first and second terminals of the other pair;
a contact brush carrier disposed between the substrate elements and mounted on the rotatable shaft for rotation therewith;
first and second arcuate resistance tracks and first and second collector tracks supported respectively by the first and second substrate elements;
a pair of fixed resistors supported by the second substrate element and connected respectively between one end of the second arcuate resistance track and the first and second terminals of the second substrate element;
the terminals of the first substrate element being directly connected to one end of the first arcuate resistance track and to the collector track, respectively;
a pair of spring-loaded contact brushes mounted on opposite faces of the contact brush carrier for rotation therewith, each contact brush being spring-biased into sliding bridging engagement with the arcuate resistance track and collector track of the respective substrate element to define therewith a variable resistor, said variable resistors varying in opposite senses upon rotation of the shaft;
a first terminal connection to said interconnected first terminals of the substrate elements;
a second terminal connection to said interconnected second terminals of the substrate elements; and
a third terminal connection to said second collector track.

3,924,208
TEMPERATURE COMPENSATED DIELECTRIC RESONATORS

James Kevin Plourde, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 317,385, Dec. 22, 1972. This application Apr. 28, 1975, Ser. No. 572,277
Int. Cl.² H01P 1/30, 7/06
U.S. Cl. 333—82 BT **13 Claims**

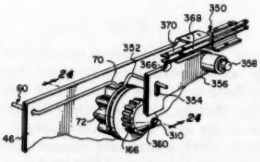


1. A microwave device comprising a first member, and a second member of pyroelectric ferroelectric material disposed on said first member, said second member having an optical axis and abutting said first member in a configuration that allows charge separation to occur between two separate surfaces intercepting said optical axis, and resistive means contacting and providing coupling between said two surfaces of said second member and having a resistance less than that of said pyroelectric ferroelectric material for counteracting said charge separation.

3,924,209
UHF TUNER HAVING A SIMPLIFIED AFC DEFEAT MECHANISM

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Division of Ser. No. 350,742, April 13, 1973, Pat. No. 3,842,683, which is a continuation of Ser. No. 174,722, Aug. 25, 1971, abandoned. This application Oct. 16, 1974, Ser. No. 515,209
Int. Cl.² H03J 5/00
U.S. Cl. 334—39 **4 Claims**



1. The combination of, a UHF tuner having a continuously variable main tuning shaft rotation of which is effective selectively to receive signals from all stations in the UHF television band, a station selector shaft, gear means interconnecting said selector shaft and said main tuning shaft, a star wheel disposed concentrically about said selector shaft for rotation therewith, a spring member engageable by said star wheel to establish a stop position of said main tuning shaft for each of the seventy television stations in the UHF band, a fine tuning shaft positioned inside of said selector shaft, said fine tuning shaft being

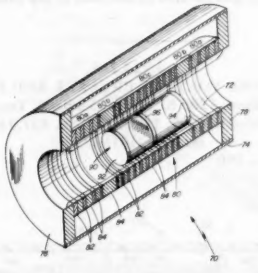
normally biased to a forward position and being movable to a rear position, means responsive to the rotation of said fine tuning shaft while it is in said rear position for effecting a fine tuning operation at each of said stop positions of said main tuning shaft, said fine tuning shaft being disengaged from said selector shaft when said fine tuning shaft is in said forward position and wherein said UHF tuner is provided with automatic frequency control means normally responsive to a control signal, switching means affixed to said television tuner and electrically coupled to said automatic frequency control circuit, actuation of said switching means being effective to defeat the operation of said automatic frequency control circuit, means mechanically interconnecting said selector shaft and said switching means, said interconnecting means including a pivotable lever engageable by said spring member upon rotation of said selector shaft, said lever being effective to actuate said switching means in response to engagement thereof by said spring member, means responsive to the longitudinal movement of said fine tuning shaft for engaging said lever and actuating said switching means upon movement of said fine tuning shaft to said rear position, said longitudinal movement responsive means including a camming member having a nonuniform circular cross section along a central axis thereof, said camming member being mounted coaxially with said fine tuning shaft and said star wheel and movable along said central axis in response to the longitudinal movement of said fine tuning shaft, said lever being engageable by said camming member for actuating said switching means upon longitudinal movement of said fine tuning shaft to said rear position.

3,924,210

FIELD SHAPING MAGNET STRUCTURE

Norman J. Dionne, Arlington Heights, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 1, 1974, Ser. No. 520,074
Int. Cl.[2] H01F *7/02*
U.S. Cl. 335—211 **10 Claims**



1. A magnet structure comprising:

a pair of spaced magnetic pole pieces operatively disposed in alignment with one another and oppositely polarized in a direction substantially perpendicular to the direction of alignment; and

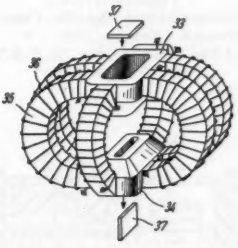
reluctor circuit means interconnecting the pole pieces for providing a desired magnetic scalar potential profile, the reluctant circuit means including a linear array of alternate nonmagnetic layers and interposed magnetic members disposed between the pole pieces, the magnetic members being spaced progressively varying distances from one another.

3,924,211

METHOD OF ORIENTING ELECTRICALLY CONDUCTIVE BODIES, PREFERABLY NON-MAGNETIC ONES, IN A MAGNETIC FIELD AND APPARATUS FOR PERFORMING SAME

Benyamin Alexandrovich Ioffe, ulitsa Raunas, 45/2, kv. 81; Robert Karlovich Kalnin, ulitsa Gorkogo, 53, kv. 19; Vyacheslav Semenovich Dorofeev, ulitsa Frunzes, II, kv. 5; Viktor Georgievich Sirotenko, ulitsa Strelnieku, 19, kv. 3, all of Riga; Vladimir Borisovich Larin, ulitsa Lomonosova, 2/72, kv. 30, Smolensk; Gunar Yanovich Sermons, ulitsa Skolas, 22, kv. 17, and Alexandr Alexandrovich Shevchenko, ulitsa Suvorova, 23, kv. 4, both of Riga, all of U.S.S.R.

Filed Dec. 15, 1969, Ser. No. 885,190
Claims priority, application U.S.S.R., Dec. 25, 1968, 1289054; Dec. 25, 1968, 1289056
Int. Cl. H01f *13/00*
U.S. Cl. 335—284 **3 Claims**



1. An apparatus for orienting electrically conductive bodies, said apparatus comprising an electromagnetic including magnetic core means including a plurality of generally C-shaped magnetic core members cooperatively defining an orientation zone, said electromagnet also comprising winding means adapted to be connected to an alternating electric current source, a pair of pole pieces, all of said plurality of magnetic core members being associated with said pair of pole pieces, a first one of said pole pieces being disposed above a second one of said pole pieces, said first pole piece provided with at least one passage extending therethrough, through which a body can be introduced into said orientation zone to be oriented therein, said second pole piece being provided with at least one passage extending therethrough, through which said body can leave said orientation zone after the orientation operation.

3,924,212

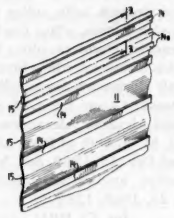
FENDER PROTECTOR CLOTH WITH FLEXIBLE MAGNETIC STRIPS

Fred C. Brown, 3462 - 79th Ave. North, St. Petersburg, Fla. 33702

Filed Aug. 21, 1974, Ser. No. 499,544
Int. Cl.[2] H01F *7/02*
U.S. Cl. 335—303 **9 Claims**

1. A mechanic's protective fender cloth which comprises a pliant cloth-like member and elongated flexible magnetic

strips affixed at predetermined intervals along said cloth-like member, a portion of said strips being on one side of said



cloth-like member and a further portion of said strips being on the other side of said cloth-like member.

3,924,213

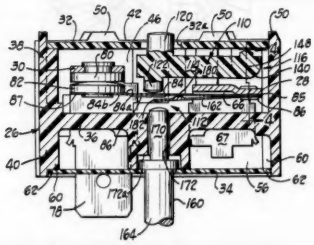
THERMOSTAT

Alexander MacGregor Semple, Oakville, Canada, assignor to Ranco Incorporated, Columbus, Ohio

Filed Sept. 30, 1974, Ser. No. 510,700

Int. Cl.² H01H *61/00*

U.S. Cl. 337—130 **9 Claims**



1. A thermostat comprising:

a. a housing assembly;

b. switch means disposed in said housing and comprising a first contact supported by said housing assembly, a second contact, snd switch blade means having a first end region supported by said housing assembly and a second projecting end region supporting said second contact for movement into and away from engagement with said first switch contact;

c. thermally responsive actuator means connected to said housing assembly and including a surface movable relative to said housing assembly toward and away from said switch blade means in response to sensed changes in temperature, said surface movable in a direction transverse to the extent of said blade means;

d. a switch operating arrangement comprising a switch operator lever structure disposed between said thermally responsive means and said blade means for transmitting motion of said surface of said thermally responsive means to said blade means, said lever structure having a first lever portion for engaging said surface of said thermally responsive means, a second lever portion for engaging said blade means between said first and second end regions, and a heat insulative lever body rigidly interconnecting said first and second lever portions and extending from said lever portions generally transversely of the direction of movement of said surface; and,

e. hinge means interconnecting said lever body and said housing assembly for constraining movement of said first and second lever portions about a hinge axis disposed in a plane which is transverse to the direction of movement of said surface, said hinge means located remote from said first and second contacts.

3,924,214

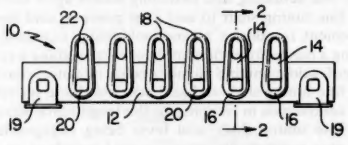
THERMAL LIMITER CONSTRUCTION FOR ONE OR MORE ELECTRICAL CIRCUITS AND METHOD OF MAKING THE SAME

Emil Robert Plasko, Washington Township, Ohio, assignor to Micro Devices Corporation, Dayton, Ohio

Division of Ser. No. 321,753, Jan. 8, 1973, which is a continuation-in-part of Ser. No. 217,927, Jan. 14, 1972, Pat. No. 3,764,948, which is a continuation-in-part of Ser. No. 101,848, Dec. 28, 1970, Pat. No. 3,649,942, which is a continuation-in-part of Ser. No. 62,369, Aug. 10, 1970, abandoned. This application July 22, 1974, Ser. No. 490,732

Int. Cl.² H01H *85/02*

U.S. Cl. 337—163 **3 Claims**



1. A terminal assembly for a thermal limiter comprising:

a wire wound heating rod,

a pair of blade-like electrical terminals arranged in line and connected physically and electrically to the ends of said heating rod for supplying electrical heating current thereto.

a substantially cylindrical temperature sensitive fuse having connecting wires extending from each end thereof, one of said wires being connected to one of said terminals and said fuse being disposed adjacent said rod in substantially parallel relation thereto, and

a third electrical terminal connected physically and electrically to the other one of said fuse connecting wires and having its axis parallel to the axes of the other two terminals.

3,924,215

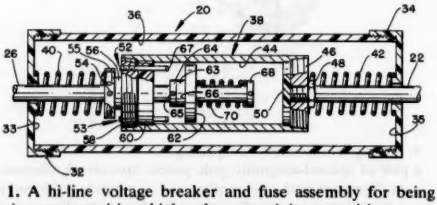
HI-LINE VOLTAGE BREAKER AND FUSE

Danny R. Allison, 1205 S. Moran, Midland, Tex. 79701

Filed Dec. 12, 1974, Ser. No. 531,930

Int. Cl.² H01H *85/36*

U.S. Cl. 337—190 **11 Claims**



1. A hi-line voltage breaker and fuse assembly for being series connected in a high voltage conduit, comprising:

an elongated outer housing having opposed ends axially aligned respective to each other; first and second current carrying link members, an elongated inner housing reciprocatingly received within said outer housing and having opposed end portions axially aligned respective to each other, said outer and inner housings and said first and second link members being axially aligned with respect to one another;

said first link member having opposed end portions with a fixed end thereof affixed to said inner housing and an opposed free end thereof is adapted to be affixed to a current carrying conductor; a marginal length of said first link member being slidably received in a reciprocating manner within one end of said outer housing, a marginal length of said second link member being slidably received in a reciprocating manner within said outer housing;

biasing means by which opposed ends of said outer housing are urged away from opposed ends of said inner housing so that said inner housing is urged towards a position intermediate said opposed ends of said outer housing;

means by which a marginal end of said second link member is reciprocatingly received within said inner housing, a fuse means connected to said inner housing and extending into the interior thereof, electrical contact means on said second link member movable into engagement with said fuse means when said first and second link members are moved away from one another; means forming a current flow path through said first link member to said fuse means; means forming a current flow path through said second link member to said electrical contact means; so that:

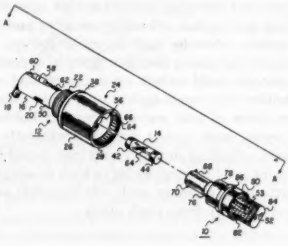
connection of the free ends of said first and second link members in series relationship into a current carrying hi-voltage conduit of a hi-line under tension will move said electrical contact into engagement with said fuse and thereby provide a voltage breaker and fuse which will assume a current carrying configuration, and upon parting of the hi-line or upon excessive current flow through said fuse, said assembly will assume a non-conductive configuration.

3,924,216

SHIELDED INDICATING LAMP FUSEHOLDER

Burton L. Martin, and Peter E. Tilly, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 24, 1975, Ser. No. 543,839
Int. Cl.² H01H *85/30*
U.S. Cl. 337—206 **9 Claims**



1. A shielded indicating lamp fuseholder for housing a tubular fuse while mounted in a metal panel comprising:

a female member for mounting in the panel having terminals for connection to the circuit to be protected by the fuse and an annular terminal at its front end in contact with the panel through which the fuse is received from the front of the panel;

a male member having a housing at one end for receiving one end of the fuse and a lamp at the other end which illuminates when the fuse is blown, said housing being engageably insertable in said female member through said annular terminal to complete the assembly of the fuseholder, whereupon parallel electrical paths via the protected circuit are established through the fuse and said lamp;

a metal ring encircling the outer wall of said lamp located so that when said male member engages said female member, said ring comes into contact with said annular terminal, and

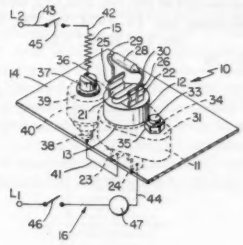
a wire mesh jacket which completely enshrouds the surfaces of said lamp above said ring and is connected thereto.

3,924,217

THERMAL LIMITER CONSTRUCTIONS

Emil Robert Plasko, Washington Township, Montgomery County; James Allen Kohl, Kettering, and Michael Raymond Hutchison, Wayne Township, Montgomery County, all of Ohio, assignors to Micro Devices Corporation, Dayton, Ohio

Division of Ser. No. 335,911, Feb. 26, 1973, Pat. No. 3,839,693, which is a division of Ser. No. 179,688, Sept. 13, 1971, Pat. No. 3,731,248. This application July 22, 1974, Ser. No. 490,871
Int. Cl.² H01H *84/48*
U.S. Cl. 337—208 **10 Claims**



1. A thermal limiter construction for at least one electrical circuit comprising a body member formed of electrical insulating material and having a relatively long reduced portion projecting therefrom adapted for insertion in an opening of a frame while said body member is adapted to abut one side of said frame outboard of said frame opening, said long reduced projecting portion having a longitudinal axis, a pair of lead means carried by said construction for lead attachment thereto, and a thermally responsive device carried by said reduced portion and being interconnected in series with said lead means, one of said lead means of said construction having a single fastening opening passing therethrough and being adapted to fasten said body member to said frame by a single fastening member passing through said fastening opening when said projecting portion of said body member is fully inserted in said frame opening, said fastening opening passing through said one lead means in offset relation to said projecting portion thereof and being substantially parallel to said longitudinal axis of said projecting portion whereby said fastening member and said reduced projecting portion are adapted to cooperate to prevent pivoting of said projecting portion out of said frame opening.

3,924,218

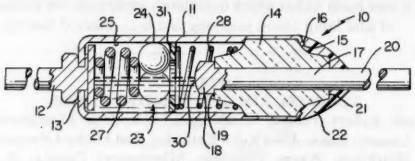
THERMAL LIMITER CONSTRUCTION

Emil Robert Plasko, Washington Township, Ohio, assignor to Micro Devices Corporation, Dayton, Ohio

Filed May 22, 1974, Ser. No. 472,413
Int. Cl.² H01H *37/76*
U.S. Cl. 337—407 **5 Claims**

1. In a thermal limiter construction having a casing provided with an end plug carrying a conductor with an enlarged contact head inside said casing and against which spring controlled sliding contact means in said casing normally engages to conductively interconnect said casing and said conductor together, the improvement comprising a washer-like member telescopically disposed about said contact head and disposed between said sliding contact means and a spring that acts

between said sliding contact means and said end plug to tend to move said sliding contact means away from said contact



head whereby said washer-like member separates said spring from said sliding contact means.

3,924,219

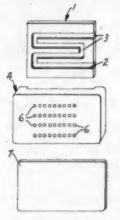
GAS DETECTION DEVICE

David L. Braun, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 210,672, Dec. 22, 1971. This application Apr. 19, 1974, Ser. No. 462,415

Int. Cl.² H01C *13/00*

U.S. Cl. 338—34 **10 Claims**



1. A device useful for measuring the amounts of at least one selected gas in an ambient gas mixture comprising:

a shallow chamber having one open end comprised of a side of said chamber;

a detector substance adapted to interact with the gas to be measured located within said chamber;

a porous gas flow attenuating sheet which allows passage of ambient atmosphere closing the open end of said chamber distally to and spaced apart from said detector substance to form a relatively placid layer of gas between said ambient gas mixture and said detector substance;

whereby the amount of said selected gas available to react with said detector substance is caused to be a function of diffusion through the placid layer of gas and is substantially independent of velocity of the gas mixture at the interface of the device with the ambient surroundings.

3,924,220

ELECTRIC SWITCH COMBINED WITH VARIABLE RESISTOR

Hiroshi Matsui, Neyagawa; Hisao Kitahara, Takatsuki, and Shozo Watanabe, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 3, 1974, Ser. No. 475,597

Claims priority, application Japan, June 13, 1973, 48-70473

Int. Cl.² H01C *9/08*

U.S. Cl. 338—172 **1 Claim**

1. An electrical switch combined with a variable resistor, comprising:

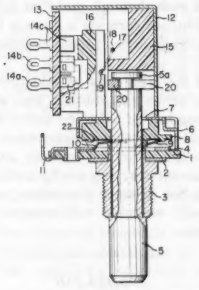
a. a dielectric base,

b. an operating shaft axially slidable and rotatably mounted in the base,

c. a variable resistor mounted in said base and provided with a wiper arm rotatably coupled to the shaft and fixed in the axial direction,

d. a switch cover housing fixed to the base and being provided with at least two internal walls substantially parallel to the shaft axis, one of the two parallel walls of the switch cover housing being provided with stationary switch contacts,

e. a dielectric movable contact holder provided with switch contacts and slideably arranged in the switch cover housing abutting said one of said two parallel walls for motion in a direction parallel to said one of said walls, a switch actuating member slideably arranged in said switch cover housing abutting another of said two parallel walls for motion in a direction parallel to said other of said two parallel walls, an end of the operating shaft being rotatably coupled to said switch actuating member and translationally fixed to the switch actuating member for moving said switch actuating member in said switch covered housing in a direction parallel to the operating shaft axis, and



f. spring means interconnecting said movable contact holder and said switch actuating member for biasing said movable contact holder in a direction opposite to the direction of said axial motion of the shaft and actuating member and for biasing said switch actuating member and said movable contact holder against said walls abutting said switch actuating member and movable contact holder, whereby said movable contact holder and said switch actuating member move in opposite directions and whereby said switch contacts of said movable contact holder are urged against said fixed switch contacts in a position of said movable contact holder by said spring means, said spring means operatively interconnecting said actuating member and said movable contact holder being a U-shaped spring which is adapted to force said actuating member and said movable contact holder to move away from each other.

3,924,221

FILM RESISTOR AND METHOD

Ernel R. Winkler, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 16, 1974, Ser. No. 533,081

Int. Cl.² H01C *1/02*

U.S. Cl. 338—308 **6 Claims**

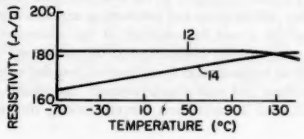
1. A method of making an electrical resistance element comprising the steps of

forming a paste containing a temporary binder and a mixture of inorganic particulate matter, said mixture including 30–70 wt. percent glass frit, the remainder consisting essentially of finely divided particles of MoO_3 and an elemental reducing agent, said glass frit containing lead oxide in an amount effective for yielding $PbMoO_4$, the amount of said reducing agent in said mixture being sufficient to permit the formation of MoO_2 in an amount sufficient to form a continuous conductive path and of

$PbMoO_4$ in an amount effective to modify the temperature coefficient of resistance of said conductive path,

applying a film of said paste to a refractory nonconductive substrate, and

heating said substrate and film in an inert atmosphere to a temperature of at least 650°C and which is sufficiently



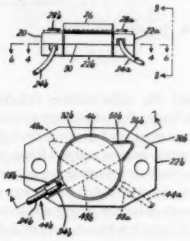
high to cause a reaction between the PbO in the glass frit and the MoO_3 to form $PbMoO_4$ and between MoO_3 and said reducing agent to form MoO_2 and an oxide of said reducing agent, said temperature also being sufficiently high to fuse said finely divided particles of glass frit and produce a continuous glassy phase having particles of MoO_2 and $PbMoO_4$ uniformly dispersed throughout.

3,924,222

RESISTANCE DEVICES FOR USE IN ENERGIZING THE STARTING WINDING OF A SPLIT PHASE INDUCTION MOTOR

Charles W. Slocum, Spring Lake Heights, N.J., assignor to Thermo-Electronics, Inc., Allenwood, N.J.

Filed Oct. 9, 1974, Ser. No. 513,256
Int. Cl.² H01C *1/02*
U.S. Cl. 338—220 **1 Claim**



1. For use in selectively energizing the starting field winding of a split phase induction motor, a positive temperature coefficient resistance device being adapted to be series-connected with said starting field winding, said device comprising:

a. a multiple piece housing having matching surfaces between two of said pieces, and having a cavity which opens into said matching surfaces and which includes both a first receiving surface in spaced parallel relationship to said matching surfaces and a second receiving surface in spaced parallel relationship to said first receiving surface;

b. notch means comprising oppositely-disposed notches in said housing which open into said cavity and into said matching surfaces, for positioning each of a pair of strip contacts in said housing in rectilinear relationship to respective ones of said receiving surfaces and for providing access from the outside of said housing to said cavity for a pair of electrical conductors;

c. a pair of elongated metallic strip contacts being inserted into said cavity, each being positioned proximal to one of said receiving surfaces, each having one end thereof positionally engaged with one of said notches, and each having terminal means on the other end thereof positionally engaged with an oppositely disposed one of said notches;

d. a positive temperature coefficient resistor having parallel-disposed contact surfaces, and being inserted into said cavity intermediate of said contacts; and

e. means for securing said housing pieces into fixed engagement,

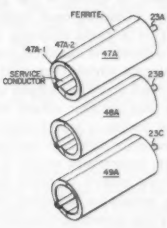
said housing being formed of dielectric material in two identical pieces, said notch means includes a pair of said oppositely-disposed notches in each of said pieces, each pair of said notches including a terminal receiving notch which extends from said cavity to the outside of said housing and which is rotationally displaced about said matching surfaces from the other of said terminal receiving notches when said housing is assembled, said electrical contacts are each of electrical conductor spring metal, are each of an elongated and generally rectangular shape, are each wider than said terminal receiving notches, are each formed with a bow intermediate the ends thereof to provide spring-loaded contact with said contact surfaces, and each include a swagable lug portion on one end thereof to provide said terminal means and to fit one of said terminal notches; a pair of insulated electrical conductors each being swaged to one of said lugs in electrical conducting contact therewith; said positive temperature coefficient resistor includes a layer of silver on each of said parallel-disposed contact surfaces, said securing means comprises a pair of holes which receive a pair of tubular rivets, respectively, and each including a head portion on each end thereof to secure said rivets to said pieces, and spring clip means having two holes therethrough spaced to match said holes in said housing pieces and being inserted between one of said housing pieces and a pair of said head portions for attaching said device to any thin and substantially flat element by sliding said spring clip thereover.

3,924,223

POWER LINE COMMUNICATION SYSTEM HAVING A PROTECTIVE TERMINATING IMPEDANCE ARRANGEMENT

Ian A. Whyte, Pittsburgh, and Leonard C. Vercellotti, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 21, 1974, Ser. No. 444,587
Int. Cl.² H04M *11/04*
U.S. Cl. 340—310 R **9 Claims**



1. A power line communication system transmitting high frequency carrier communication signals through power line conductors of a distribution network supplying power to electric loads at the premises of an electric utility customer with the customer electric loads characterized by varying impedance values and at least periodically being at very low impedance values, wherein the system comprises:

a plurality of service conductors including line and grounded conductors at the customer premises connecting the power line conductors of said distribution network to the customer electric loads so as to supply electric power to the loads while concurrently having said high frequency carrier communication signals transmitted thereon;

a communication terminal coupled to a pair of said service conductors including at least one line conductor for

transmitting and receiving said high frequency carrier communication signals through said service conductors; and

means forming a terminating impedance in the service conductors at the premises of the utility customer including tubular magnetic core means, said at least one line conductor passing through said tubular magnetic core means at a location intermediate said communication terminal and said customer electric loads, and said magnetic core means effecting a predetermined inductance having a substantially increased value of impedance at the frequencies of the communication signal relative to the very low impedance values of said customer electric loads.

3,924,224

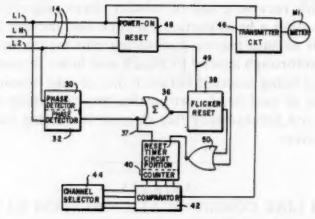
METER READING SYSTEM

Robert E. Dyer, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Filed May 15, 1974, Ser. No. 470,267

Int. Cl.[2] H04M *11/04*

U.S. Cl. 340—310 A **22 Claims**



1. In a remote meter system which uses alternating current power line conductors for data transmission purposes, a group of transmitter means coupled to said power line conductors, each of which transmitter means has a different meter associated therewith, each transmitter means comprising channel means including counter means for effecting a count of a predetermined plurality of cycles of the power on said line conductor to define a channel, each successive count of a predetermined series in a cycle defining a correspondingly different channel of a group of channels, encoding means for providing encoded signals which represent data provided by its associated meter, and enabling means in each transmitter means controlled by said counter means to enable its associated encoding means during a preselected one of said channels, the enabling means for different transmitter means being operative to enable its transmitter means in a different one of said channels, receiver means coupled to said power line conductors including means for detecting the encoded signals applied to said power line conductor in said different channels by each of said plurality of transmitter means, and means for effecting storage of the data represented by said encoded signals from each of said transmitter means in correspondingly different storage means.

3,924,225

CHARACTER DISPLAY DOT RASTER SIGNAL GENERATOR PROVIDED WITH CHARACTER MEMORY

Wolfgang Langnickel, Braunschweig, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

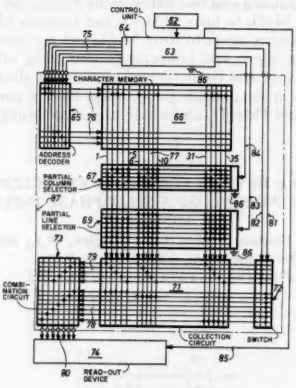
Filed May 30, 1974, Ser. No. 474,863

Claims priority, application Germany, May 30, 1973, 2327474

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 AD **8 Claims**

1. In a character signal generator for selecting the dot raster elements to be produced in a data read-out dot raster display device having a plurality of signal inputs in which signals representing, selectively, partial horizontal or vertical rows of an entire dot raster are emitted in succession, the generator including a character memory composed of a plurality of memory locations each containing a representation of a respective character available for read-out and arranged to receive address signals identifying the memory location corresponding to the character to be read out, said memory having a plurality of outputs for presenting signals containing the complete dot raster information of the addressed character, row selector means connected to the memory outputs and arranged to be switched from row to row for selecting, from the complete dot raster information, successive rows to be read out, and a collection circuit having output lines and



arranged to collect the information relating to the selected rows at its output lines, the improvement wherein: said selector means comprise first and second row selectors both connected to said selector means output lines, said first row selector being constructed to operate as a vertical row selector when a succession of vertical dot raster rows are to be read out and said second row selector being constructed to operate as a horizontal row selector when a succession of horizontal dot raster rows are to be read out; said generator further comprises means connected for rendering one of said selectors ineffective during any read-out operation; and said collection circuit comprises means connected to link the output signals of a selected one of said row selectors to conduct such signals to corresponding output lines of said collection circuit.

3,924,226

DISPLAY DEVICE HAVING AN ARRAY OF MOVABLE DISPLAY ELEMENTS

Robert H. Lacy, and James E. Russell, both of Dallas, Tex., assignors to F&M Systems Co., Dallas, Tex.

Filed May 28, 1974, Ser. No. 473,559

Int. Cl.[2] G09F *9/32*

U.S. Cl. 340—336 **18 Claims**

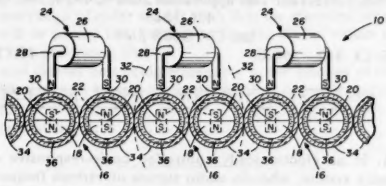
1. In a matrix display device of the type in which a plurality of display elements are individually positioned in a selected one of two display orientations to form alphanumeric characters or symbols, wherein the improvement comprises:

each of said display elements including two display members mounted for rotation about spaced, parallel axes;

each of said display members having magnet means which are oppositely poled with respect to corresponding display surfaces of said display members; and

electromagnetic means having pole pieces positioned to

cooperate with said magnet means, whereby corresponding display surfaces of each display member of each



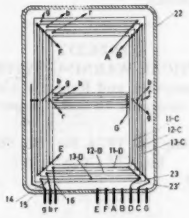
display element are simultaneously positioned in a display orientation.

3,924,227

DIGITAL DISPLAY DEVICE

Michael Stolov, 25 Hapoel St., Nof-Yam, Herzliya, Israel

Filed Nov. 7, 1973, Ser. No. 413,529
Claims priority, application Israel, Nov. 13, 1972, 40825
Int. Cl.² G08B *5/36*
U.S. Cl. 340—336 **10 Claims**



1. A digital display device for displaying a numeric desired figure in any desired color, comprising in combination:

an electronic digital display device including an arrangement of seven segments in the conventional pattern of digital display devices, comprising in combination seven groups of wires, each group comprising three parallel wires spaced apart at a small distance from each other;

a color filter having three color sections being provided so that in front of each of the three wires of each group there is located a color section of a different color;

a frosted screen being provided in front of said color filter;

a mask defining narrow transparent strips coinciding with the arrangement of said seven segments, on or in the vicinity of said frosted screen;

actuating means being provided for actuating any desired combination of the seven groups and for actuating at least one of the three parallel wires in each group.

3,924,228

ELECTROSTATICALLY ACTUATED DISPLAY PANEL

George W. Goodrich, Bloomfield Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 6, 1975, Ser. No. 538,990
Int. Cl.² G08B *5/36*
U.S. Cl. 340—336 **38 Claims**

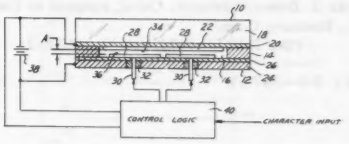
1. An electrostatically actuated display panel comprising:

a composite base having at least one electrically conductive planar surface and a thin surface layer of insulating material disposed over said conductive surface,

at least one electrically isolated, electrically conductive, flexible membrane section having a predetermined color, said membrane section having at one end a predetermined contact region fixedly attached to said composite base on the side having said layer of insulating material and electrically isolated from said conductive surface, the opposite end of said at least one membrane section being free to move under the influence of electrostatic forces;

means for conducting an electrical charge to said at least one membrane section;

a composite planar window disposed parallel to said composite base and separated therefrom by a predetermined distance slightly greater than the thickness of said membrane section, said composite window having a thin layer of transparent electrically conductive material disposed along the surface of said window adjacent to said composite base;



means rigidly supporting said composite window from said composite base and forming a peripherial fluid seal between said composite base and said composite window; and

a low conductivity high dielectric constant fluid, having a color contrasting to the color of said at least one membrane section, filling in the space between said composite window, and said composite base, said fluid having an opacity sufficient to occlude viewing of said at least one membrane section when said membrane section is disposed against the surface of said composite base.

3,924,229

BIPOLAR DIGITAL TO ANALOG CONVERTER UTILIZING TWO REFERENCE VOLTAGES OF THE SAME POLARITY

Chung C. Liu, San Jose, Calif., assignor to International Business Machines Corporation, New York, N.Y.

Continuation of Ser. No. 790,224, Jan. 10, 1969, abandoned. This application Mar. 9, 1971, Ser. No. 122,504
Int. Cl.² H03K *13/04*
U.S. Cl. 340—347 DA **3 Claims**

1. A digital to analog converter for producing an analog signal proportional to the magnitude of a digital input signal comprising:

an amplifier having a first and a second input terminal and an output terminal;

a load impedance means coupled from said output terminal to said first input terminal of said amplifier;

a reference impedance means connected directly to said first input terminal of said amplifier;

first switch means including a plurality of single pole single throw switch means;

a plurality of weighted resistors;

means for coupling a plurality of branch circuits in parallel between said first input terminal of said amplifier and a reference potential; each of said branch circuits comprising one of said single pole single throw switch means and one of said weighted resistors in series;

means coupled to each of said single pole single throw switch means for energizing said switches according to the digital values of said digital input signal to select the corresponding one of said plurality of resistors;

a first and a second reference voltage;

means for coupling said first reference voltage to the second input terminal of said amplifier;

a second reference voltage of the same polarity as said first reference voltage wherein the magnitude of said reference voltages differs by a constant factor;

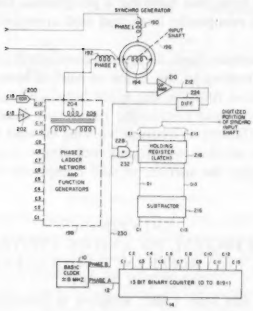
second switch means for selectively coupling said second reference voltage directly through said reference impedance means to said first input terminal of said amplifier; and

means for selectively operating said second switch means according to the sign of said digital input signal so that an analog current signal proportional to the magnitude of said digital input signal is produced at said output terminal of said amplifier.

3,924,230
SYNCHRO-TO-DIGITAL CONVERTER ARRANGEMENT FOR MANIPULATOR APPARATUS

Maurice J. Dunne, Newtown, Conn., assignor to Unimation, Inc., Danbury, Conn.

Filed Feb. 15, 1974, Ser. No. 442,862
Int. Cl.² H03K *13/00*
U.S. Cl. 340—347 SY **6 Claims**



1. In an analog-to-digital converter, the combination of, a counter having a plurality of output conductors on which the respective digits of the count thereof appear, pulse generating means connected to said counter for continuously varying the count thereof, a ladder network successive levels of which are connected to different ones of said output conductors and arranged simultaneously to develop linearly increasing signals at said successive levels of said ladder network as the count of said counter changes in a predetermined direction, summing means for said linearly increasing signals and arranged to develop an output waveform comprising a series of straight line segments corresponding to said successive levels of said ladder network and simulating a sinusoidal wave, said output waveform having zero crossover points in exact coincidence with predetermined digital outputs of said counter, synchro means having an input shaft whose position is to be indicated digitally, means for connecting said output waveform to said synchro means to energize the same, means for deriving from said synchro means an output signal corresponding to said output waveform and displaced therefrom by an amount corresponding to the position of said input shaft, means for developing a control pulse coincident with a predetermined point on said output signal, and register means controlled jointly by the output of said counter and said control pulse for developing a digital output corresponding to the occurrence of said control pulse.

3,924,231
AUDIO RESPONSIVE COLOR DISPLAY SYSTEM

Robert Bruce McClure, R.D. 2, Box 290, Malvern, Pa. 19355

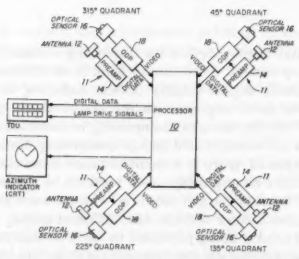
Continuation-in-part of Ser. No. 188,339, Oct. 12, 1971, Pat. No. 3,815,128. This application June 4, 1974, Ser. No. 476,324
Int. Cl.² G08B *5/36*
U.S. Cl. 340—366 B **10 Claims**

1. In an electronically controlled audio-responsive color display system, wherein audio signals of various frequencies are utilized to effect illumination in various colors, including the steps of amplifying the signals and limiting the total audio signal strength to a desired level while substantially maintaining relative signal strength, segregating the signals into a plurality of frequency bands, then for each band detecting the signals therein, producing periodic pulses of substantially constant amplitude whose duration is dependent upon the detected signal magnitude for such band, and applying the pulses from the respective bands to effect illumination in corresponding colors, the improvement comprising: producing momentary triggering pulses of uniform duration whose position relative to an AC reference signal determines the duration of such pulses.

3,924,232
OPTICAL WARNING SYSTEM

Aldo J. Burdi, Sunnyvale, and Robert S. Congleton, Newark, both of Calif., assignors to Itek Corporation, Lexington, Mass.

Filed Aug. 26, 1974, Ser. No. 500,222
Int. Cl.² G01S *7/36*
U.S. Cl. 343—6 R **4 Claims**



1. In an aircraft which has a radar antenna for receiving radar signals illuminating the aircraft and in which the received radar signals are directed to a radar processor, remote from the radar antenna, having a plurality of filtering circuits, each of which has predetermined characteristics to filter out particular radar signals having those characteristics, and in which the filtered signals are directed to a display unit for the pilot to inform the pilot as to the type of radar signals illuminating the aircraft, the improvement comprising a system for enabling optical signals, such as laser beams, which are illuminating the aircraft to be processed and displayed to the pilot to inform the pilot that the aircraft is being illuminated by such optical signals, and wherein the system may be implemented with a small number of additional components and without adding additional wiring to the aircraft running from the optical detector to the equipment for processing the optical signals and displaying them to the pilot, and comprising:

a. an optical detector means for detecting optical radiation of interest illuminating the aircraft and for producing a signal indicative of the received radiation;

b. means, responsive to the signal from said optical detector means, for analyzing the signal to determine selected parameters of the illuminating optical beam;

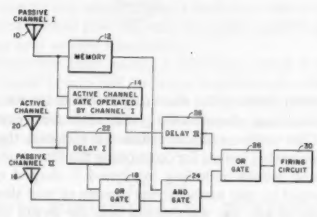
c. generator means, responsive to said analyzing means, for generating electrical signals having predetermined characteristics of radar signals such that the electrical signals will be passed by a particular filtering circuit within said radar processor; and

d. said display unit being responsive to the passage of electrical signals by said particular filtering circuit to indicate to the pilot that the aircraft is being illuminated by an optical signal.

3,924,233
ACTIVE-PASSIVE TARGET DETECTION SYSTEM

John J. Nastronero, Corona, and John C. Billings, Riverside, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1969, Ser. No. 817,256
Int. Cl.² F42C *13/02, 13/04;* **G01S** *9/02*
U.S. Cl. 343—6 R **4 Claims**



1. In an active-passive target detection system, the combination comprising:

a. A first passive target detecting means for generating a first passive signal in response to a first predetermined geometrical encounter with the target,

b. a second passive target detecting means for generating a second passive signal in response to a second predetermined geometrical encounter with the target,

c. an active target detecting means for generating an active signal in response to said first predetermined geometrical encounter with the target,

d. logic circuit means coupled to said first and second passive and active target detecting means and having an output.

e. firing circuit means coupled to the output of said logic circuit means for generating a firing pulse in response to a signal received from said logic circuit means,

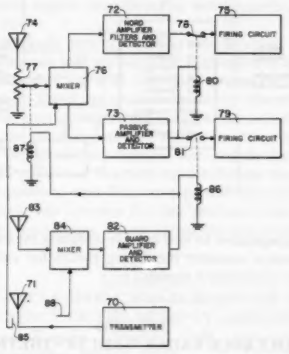
f. said logic circuit means being responsive to the appearance and disappearance of a target signal in said second passive target detecting means during the persistence of a target signal from said first passive target detecting means to pass a signal to said firing circuit means,

g. said logic circuit means being responsive to a signal appearing in said active target detecting means prior to the appearance of a signal in said first passive target detecting means to pass a signal to said firing circuit.

3,924,234
AUTOMATIC ACTIVE/PASSIVE FUZE SYSTEM

Carlton H. Cash, Norco; Robert A. Boot, Riverside; Ralph L. Bauer, Riverside, and Benjamin F. Husten, Riverside, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1960, Ser. No. 78,767
Int. Cl.² F42C *13/04;* **G01S** *7/36, 9/02;* **H04K** *3/00*
U.S. Cl. 343—7 PF **8 Claims**



1. A radio fuze system comprising means for transmitting a radio frequency signal in the direction of a target, first antenna means for receiving only the reflected signals transmitted by said transmitting means, a firing circuit, circuit means coupling said first antenna means to said firing circuit for providing an initiating signal thereto when said received signal has a magnitude of a predetermined value, second antenna means for receiving countermeasures signals, and means coupled to said second antenna means for causing said fuze system to respond to said countermeasures signals to prevent dudding past the target.

3,924,235
DIGITAL ANTENNA POSITIONING SYSTEM AND METHOD

Robert I. Heller; Francis T. Annulis, both of Baltimore, and Walter Jachimski, Lutherville, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 276,534, July 31, 1972, Pat. No. 3,793,634. This application Oct. 23, 1973, Ser. No. 408,963
Int. Cl. G01s *9/02*
U.S. Cl. 343—7.4 **6 Claims**

5. In a radar antenna positioning system, apparatus for normalizing data signals comprising:

means for sampling electrical data signals representative of a constant multiplied by the sines and cosines of twice the azimuth and the elevation angles of the reflector;

means for simultaneously sampling electrical data signals representative of a constant multiplied by the sines and cosines of the angular deviation of the aircraft axes from the axes in a predetermined coordinate system;

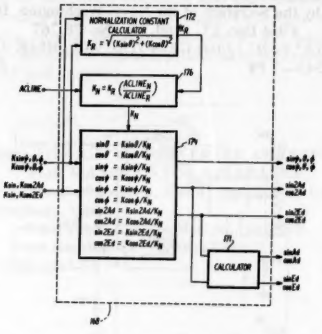
means for simultaneously sampling the AC line voltage;

means for calculating and subsequently re-calculating on a relatively low frequency basis a reference constant in response to the data signals representative of each of the angles;

means responsive to said calculating means for generating normalized data signals representing the data signals with all constants removed;

means for updating the sampling of the data signals and the AC line voltage;

means for comparing the initial AC line voltage sample with the updated sample and for modifying the reference constant in response thereto; and,



means responsive to said sample updating means and to said reference constant modifying means for calculating updated normalized signals.

3,924,236

SURVEILLANCE RADAR WITH SYNTHETIC ARRAY SCAN FOR IMPROVED ANGLE DETERMINATION

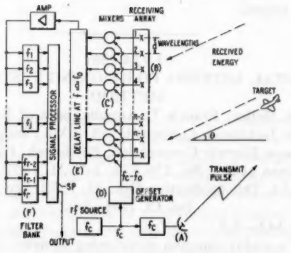
Charles William Earp, London; Carl Peter Sandbank, Bishop's Stortford; Frances Giles Overbury, Cuffley; Paul Barton, Bishop's Stortford, and Peter Kenneth Blair, Harlow, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,853

Claims priority, application United Kingdom, Nov. 27, 1973, 54971/73

Int. Cl.² G01S *9/02, 3/50*

U.S. Cl. 343—16 R **9 Claims**



1. Radio direction finding equipment for deriving angle information in respect to the position of a mobile craft from radio frequency pulses received from the craft, comprising:

receiving antenna means responsive to each of said radio frequency pulses to produce a series of *n* simultaneous signals each of the same duration and frequency as the received pulse but with a phase differential between successive signals of said series which is a function of the angle subtended by the craft with respect to said antenna means;

means for transferring said phase differential to a series of n simultaneous beat signals each of the same duration as said received pulse and at a frequency which is integrally related to the reciprocal of the duration of each received pulse; means responsive to said series of n beat signals to deliver an output signal of duration *n* times the duration of said received pulse and having a peak spectral content at a frequency which is shifted from said beat frequency by an amount indicative of said angle;

and means responsive to said output signal to discretely determine said angle.

3,924,237

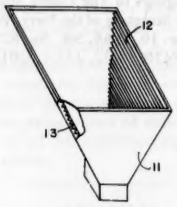
HORN ANTENNA HAVING V-SHAPED CORRUGATED SLOTS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Leon Peters, Jr., Columbus, and Carl A. Mentzer, Dayton, both of Ohio

Filed July 24, 1974, Ser. No. 491,419

Int. Cl.² H01Q *13/02*

U.S. Cl. 343—786 **1 Claim**



1. A horn antenna for directing electromagnetic energy in a given direction wherein energy diffracted from certain of the edges of the surfaces of said antenna is reduced, the improvement comprising means for controlling the illumination of said edges, said means including machined V-shaped corrugated slots formed in said surfaces, the density of said slots being of the order of ten per wavelength and the depth of the slots being between 0.3125 and 0.625 of the operating wavelength.

3,924,238

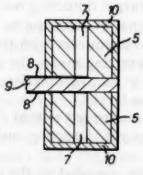
DIPOLE ANTENNA WITH DIELECTRIC CASING

James Roderick James, Swindon, England, assignor to The Plessey Company Limited, Essex, England

Filed June 12, 1974, Ser. No. 478,622

Int. Cl.² H01Q *1/40*

U.S. Cl. 343—807 **1 Claim**

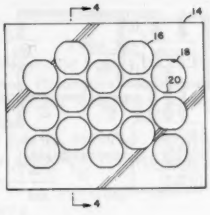


1. A radio antenna comprising a slab of insulating material having two opposed faces; two aligned conductive rods each perpendicular to one of said faces to form a dipole, a transmission line on opposite faces of the slab connected to the dipole; dielectric material surrounding each rod, and comprising a mixture of barium titanate and strontium titanate in powder form; and a housing whereby said powder is constrained in position around said rods.

3,924,239
DICHROIC PLATE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Philip D. Potter, Altadena, Calif.

Filed June 27, 1974, Ser. No. 483,851
Int. Cl.[2] H01Q 15/04
U.S. Cl. 343—909 6 Claims



1. A dichroic reflector plate of the type which reflects signals having a first frequency and passes signals therethrough having a second frequency, said reflector plate comprising

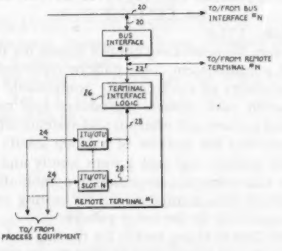
a conductive plate having a pattern of holes therethrough, said conductive plate having a thickness which provides a resonant band pass response to signals including signals having said second frequency,

said conductive plate having a thickness which is substantially equal to one-half the wave length which said second signal would have within a wave guide which has the same shaped aperture therethrough as the shape of an aperture through said dichroic reflector plate.

3,924,240
SYSTEM FOR CONTROLLING PROCESSING EQUIPMENT

Arthur P. Given, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Apr. 9, 1973, Ser. No. 349,016
Int. Cl.[2] G06F 9/18
U.S. Cl. 340—172.5 13 Claims



1. In a data processing system including a data processor and remote processing equipment, a control system comprising:

a. a controller in communication with the data processor and responsive to commands generated by the data processor for,

1. generating system address signals,

2. generating functions signals, and

3. conveying data between the data processor and the remote processing equipment;

b. a bus connected to said controller for conveying the system address signals, the function signals and data; and,

c. a plurality of simultaneously addressable terminal devices connected in parallel to said bus and further connected to the processing equipment for selectively directing the transfer of data via said bus between the processing equipment and the data processor, each of said terminal devices comprising,

1. at least one data transfer unit for directing the transfer of data between the data processor and processing equipment,

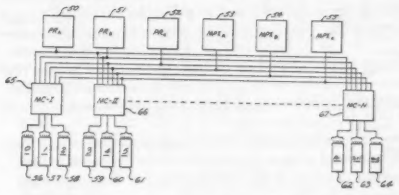
2. decoding means responsive to prescribed system address signals to generate selection signals, each of said selection signals identifiying an individual data transfer unit, and

3. routing logic interconnecting said bus and said data transfer unit, said routing logic responsive to said selection signals from said decoding means for routing a selection signal to each individually identified data transfer unit during a first time period as defined by a first one of said function signals to thereby address each identified data transfer unit and further responsive to additional function signals during time periods subsequent to said first time period for routing data over said bus between the data processor and the processing equipment, via an identified data transfer unit.

3,924,241
MEMORY CYCLE INITIATION IN RESPONSE TO THE PRESENCE OF THE MEMORY ADDRESS

Reinhard Kurt Kronies, Glendora, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 123,959, March 15, 1971, Pat. No. 3,742,253. This application May 7, 1973, Ser. No. 357,956
Int. Cl.[2] G06F 13/00
U.S. Cl. 340—172.5 9 Claims



1. In a computer system having a plurality of requestor units made up of processors and/or multiplexors, a plurality of randomly accessible memories and a memory control unit between each requestor and a group of memories to control access to each memory in the group of memories;

means for selectively coupling a requestor unit to a selected memory;

said coupling means including circuit means for cross routing the address data from a requestor unit to a selected memory;

the address cross-routing means including

a controllable gate for each bit of memory address data for each requestor unit, with this group of gates forming a first group of controllable gates; a controllable gate for the complement of each bit of memory address data for each requestor unit, with this group of gates forming a second group of controllable gates;

means for connecting in common the output of the controllable gates in the first group for the corresponding individual bits of address data from a requestor;

means for connecting in common the output of the controllable gates in the second group for the complement of the individual corresponding bits of address data from a requestor;

an electronic device for each bit of address data, each electronic device operating as an RS flip-flop

for a first and a second combination of binary input signals, said electronic device having two input terminals and two output terminals, with one input terminal being connected to the commonly connected output of the first group of controllable gates, and the other input terminal being connected to the commonly connected output of the second group of controllable gates;

circuit means for identifying the memory requested by a requestor;

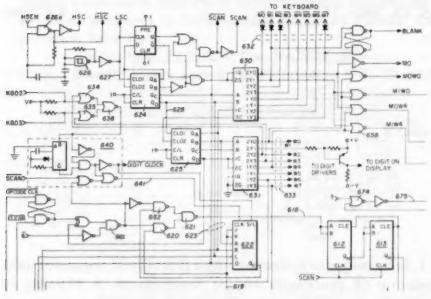
circuit means for granting access to a requested memory to the highest priority requestor only by generation of an access granted signal;

circuit means for enabling the gates in the address cross-routing means in response to the presence of an access granted signal; circuit means for cross routing the information data from the requestor unit that is granted access to the requested memory module; and means responsive to the presence of all bits of address data at the outputs of all electronic devices to automatically start the memory cycle.

3,924,242
SYSTEM FOR BUILDING OP CODES

Royce E. Naud, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 7, 1974, Ser. No. 431,590
Int. Cl.² G06F *3/02*
U.S. Cl. 340—172.5 **9 Claims**



1. In a computing system which operates according to complex n bit OP codes, a system for building such complex OP codes from sequential inputs of less complex n bit OP codes comprising:

a. an n bit parallel-in, parallel-out storage register means having an n bit input and an n bit output;

b. an input source for generating the n bits of said less complex OP codes in parallel;

c. *n* EXCLUSIVE OR gates each having first and second inputs and an output;

d. first connection means separately coupling each bit of said input source of OP codes to the first input of a respective one of said EXCLUSIVE OR gates;

e. second connection means separately coupling the outputs of said EXCLUSIVE OR gates to respective bits at the input of said storage register means;

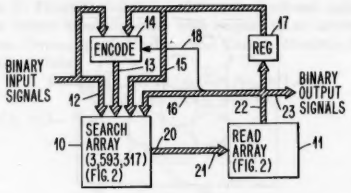
f. third connection means separately coupling each output of said storage register means to the second input of a respective one of said EXCLUSIVE OR gates; and

g. means coupled to said input source and operable upon generation of each of said less complex n bit OP codes for clocking said storage register means to load the output of said EXCLUSIVE OR gates into said storage register means.

3,924,243
CROSS-FIELD-PARTITIONING IN ARRAY LOGIC MODULES

Johannes C. Vermeulen, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1974, Ser. No. 495,165
Int. Cl.² G11C *15/00*
U.S. Cl. 340—172.5 **6 Claims**



1. An array digital signal processor having an array of logic elements with a plurality of columnar input lines logically associatable by predetermined electrical connections in array form with a plurality of columnar output linès, said electrical connections each including electrical switching elements,

the improvement including in combination:

an encoder circuit having a plurality of output connections to predetermined ones of said columnar input lines and having first and second input portions,

said encoder circuit supplying output signals at said output connections dependent upon both said input portions,

input means for receiving a plurality of binary signals and means for supplying one of said binary signals to said first input portion, and

means connecting at least one of said columnar output lines to said second input portion.

3,924,244
SYSTEM FOR THE ELECTRONIC CONTROL OF TEXTILE MACHINES OR FOR THE MANUFACTURE OF CONTROL STRIPS FOR TEXTILE MACHINES

Helmut Seitz, Kaufbeuren, Germany, assignor to Firma Franz Morat GmbH, Stuttgart-Vaihingen, Germany

Continuation of Ser. No. 211,513, Dec. 23, 1971, abandoned.
This application Oct. 15, 1973, Ser. No. 406,661
Int. Cl.² G06F *15/46*
U.S. Cl. 340—172.5 **54 Claims**

1. A system for generating control signals for the electronic control of a multisystem color pattern reproducing machine having a plurality of electronically controllable working systems, wherein each system reproduces one predetermined color of said pattern and wherein said systems are divided into groups such that the systems of a group jointly reproduce a line of said pattern and said groups jointly and successively reproduce said pattern, comprising in combination:

a. an information storage means for storing color information according to the color pattern;

b. a color line deriving means for reading out said information from said information storage means and for converting said information to color lines, each color line containing in series form all information of a predetermined color in a predetermined line of said pattern;

c. a working storage means coupled to said color line deriving means to receive said color lines, the number of color lines stored in said working storage corresponding at least to the number of systems;

d. read-out means controlled by a first clock generator producing first clock pulses corresponding to the working speed of said color reproducing machine, said read-out means being coupled to said working storage means and said working systems for reading out said color lines and for converting said color lines to control signals, the

control signals of each color line being fed to an associated working system; and

e. a control circuit including color line exchanging means coupled to said color line deriving means and said working storage means for controlling exchanges of said color lines in said working storage means in a predetermined sequence, so that each system of said color pattern reproducing machine is controlled in accordance with said pattern.

3,924,245

STACK MECHANISM FOR A DATA PROCESSOR

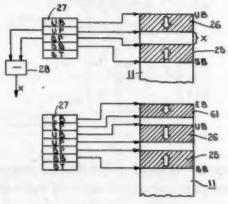
John Richard Eaton, Haslingden, England, and Philip Ronald Brady, Swansea, Wales, assignors to International Computers Ltd., England

Filed July 16, 1974, Ser. No. 488,907

Claims priority, application United Kingdom, July 18, 1973, 34215/73

Int. Cl.[2] G06F *13/00*

U.S. Cl. 340—172.5 6 Claims



1. A data processing system comprising: an information store; means for writing information of a first category into the store, in a first stack advancing, as information is added to it, in a first predetermined direction from a first base address; and means for writing information of a second category into the store, in a second stack advancing, as information is added to it, in a second predetermined direction opposite to said first direction from a second base address spaced from said first base address in said first direction.

3,924,246

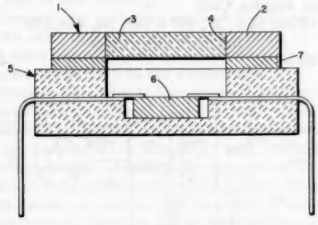
ULTRAVIOLET-TRANSMITTING WINDOW

Jeremy D. Scherer, Dartmouth, Mass., assignor to Isotronics, Inc., New Bedford, Mass.

Filed May 15, 1974, Ser. No. 470,123

Int. Cl.[2] G11C *17/00, 11/34, 13/04*

U.S. Cl. 340—173 SP 11 Claims



1. An erasable programable read only memory device comprising a semi-conductor package having a cavity extending inwardly from one surface thereof, an erasable programmable memory chip disposed within said cavity, a metallic mounting member disposed about the periphery of said cavity on said one surface, said metallic mounting member having an aperture therethrough, and an ultraviolet-transmitting glass member sealed within said aperture, said metallic mounting member having a higher coefficient of thermal expansion than said glass member, and said glass member being sealed within the aperture of said metallic mounting member by the compressive forces between said glass member and metallic mounting member.

3,924,247

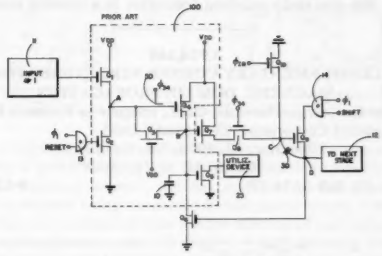
DRIVER CELL WITH MEMORY AND SHIFT CAPABILITY

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 21, 1974, Ser. No. 499,252

Int. Cl.[2] G11C *11/24, 19/18*

U.S. Cl. 340—173 CA 11 Claims



1. In combination,

memory cell means,

source means for supplying at least one reference potential, input means connected to said memory cell means to supply input signals thereto,

first output means connected to said memory cell means to drive a utilization device,

second output means connected to said memory cell means, and

feedback means connected from said memory cell to said source means to selectively supply said at least one reference potential to said memory cell to thereby clear said memory cell,

said second output means connected to said feedback means to control the conductivity thereof.

3,924,248

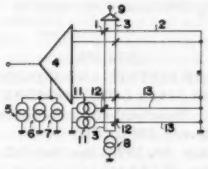
NON DESTRUCTIVE READ OUT MAGNETIC CORE MEMORY APPARATUS HAVING LINEAR HYSTERESIS LOOP NOISE CANCELLING CORE

Seihin Kobayashi, and Michihiro Torii, both of Shizuoka, Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1974, Ser. No. 429,740

Int. Cl.[2] G11C *7/02, 1/67*

U.S. Cl. 340—174 DC 3 Claims



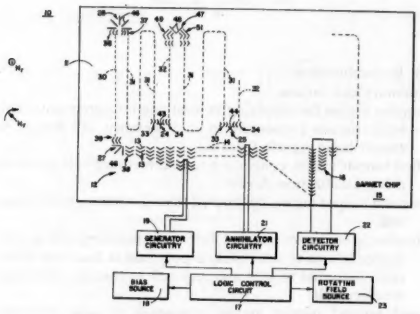
1. A non-destructive read-out magnetic core memory apparatus comprising:

a plurality of toroidal magnetic cores having a square-loop magnetic characteristic arranged in a matrix;
a plurality of digit-sense lines;
a plurality of word lines crossing said digit-sense lines;
said digit-sense lines and word lines being threaded through said toroidal magnetic cores;;
a read driver connected to said word lines to supply a read current to cause reversible magnetization change to a selected core among said toroidal cores;
a plurality of digit drivers connected to said digit-sense lines; and
a plurality of cancelling means comprising a cancelling conductor parallel to said word lines, a cancelling driver connected to said cancelling conductor, and a cancelling toroidal core having a magnetic linear hysteresis loop characteristic;
said cancelling core being penetrated with said digit-sense line and said cancelling conductor in a crossing manner.

3,924,249
COMPLEMENTARY CORNER STRUCTURES FOR MAGNETIC DOMAIN PROPAGATION

Peter K. George, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 27, 1974, Ser. No. 455,177
Int. Cl.² G11C *11/14, 19/08*
U.S. Cl. 340—174 TF **8 Claims**



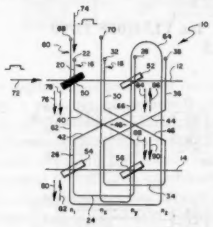
1. A magnetic domain device comprising:
a layer of magnetic material in which single wall magnetic domains can be moved;
a patterned arrangement comprising a plurality of magnetically soft elements in juxtaposition to and supported by said layer, said magnetically soft elements responsive to a cyclically varying magnetic field in the plane of said layer for moving domains in said layer along a channel defined by said patterned arrangement,
at least one portion of said channel comprising an array of cooperating elements operative within one period of said cyclically varying magnetic field to enlarge, contract, and enlarge a domain propagated thereby in order to change the continuing direction of said domain.

3,924,250
MAGNETIC CORE MATRIX AND WINDING PATTERN FOR MASS CORE MEMORY

Charles C. M. Ngo, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 19, 1974, Ser. No. 462,267
Int. Cl.² G11C *5/06, 11/06*
U.S. Cl. 340—174 CR **7 Claims**

1. A core memory matrix comprising:
a. a plurality of word wires positioned in adjacent rows and developing a row pattern.
b. a plurality of interwoven first and second digit wire loops including
1. respective first and second digit wire bights,
2. first and second legs of each of said first and second wire bights developing a columnar pattern transverse to said row pattern,
3. said legs positioned as adjacent pairs of said first legs and of said second legs,
4. a periodic double cross-over of said adjacent first legs and said adjacent second legs which flip-flops the positions of said legs of said first and second digit wire loops in said columnar pattern,
c. a plurality of magnetic memory core having a magnetic memory core at each selected intersection of said word wires and said digit wire legs, said core threaded by one of said word wires and one of said digit wire legs,

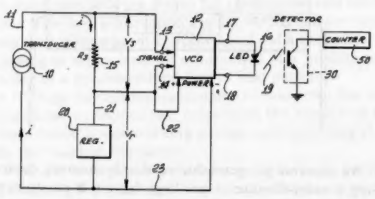


d. respective ones of said plurality of magnetic memory cores positioned on adjacent sides of each of said periodic double cross-over said respective ones of said cores on said adjacent sides being equal in number, and
e. a continuous sense wire loop threaded through each magnetic core, said sense wire loop having a sense wire bight and first and second sense wire legs, said first sense wire leg threaded in alternate first and second directions along selected first ones of said digit wire columns developing a plurality of adjacent first sense wire leg pairs with one leg of each of said first sense wire leg pairs oriented in said first direction, said second sense wire leg threaded in said alternate first and second directions along selected second ones of siad digit wire columns developing a plurality of adjacent second sense wire leg pairs with one leg each of said second sense wire leg pairs oriented in said first direction, each of said first sense wire legs spaced apart from a paired first sense wire leg by an interjacent second sense wire leg pair.

3,924,251
INPUT SIGNAL POWERED CONVERTER

Geoffrey J. Crask, Santa Ana, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Mar. 25, 1974, Ser. No. 454,370
Int. Cl.² G08C *19/02*
U.S. Cl. 340—190 **4 Claims**



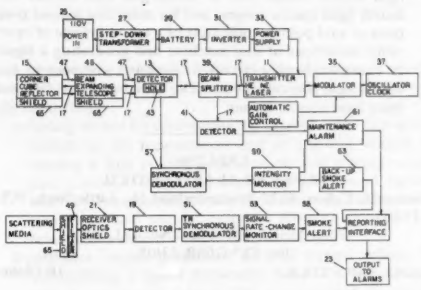
1. In convertor apparatus,
a. current generating transducer means to produce an analog output current,

b. Converter means responsive to said transducer means output current to produce an oscillatory output signal which varies as a linear function of said transducer means output current,
c. a current measuring resistor,
d. A voltage regulator,
e. a series circuit of said transducer means, said resitor, and said voltage regulator,
f. said converter means having its input coupled to said resistor to be controlled by said analog output current,
g. said voltage regulator energizing said converter means, and
h. sensing means responsive to said output signal for yielding an analog output corresponding to said transducer means input.

3,924,252
LASER SMOKE DETECTION

David Kenneth Duston, Schenectady, N.Y., assignor to Espey Mfg. & Electronics Corporation, Saratoga Springs, N.Y.

Continuation-in-part of Ser. No. 341,533, March 15, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,793
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—237 S **6 Claims**

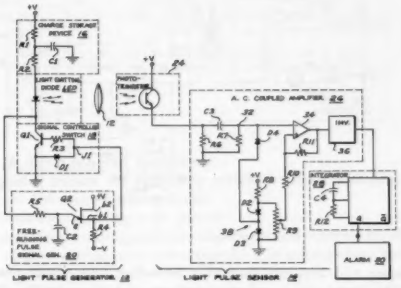


1. A smoke detecting system for detecting smoke in a building having two opposing walls comprising in combination:
a. an amplitude modulated laser beam transmitter including means for directing the beam along a predetermined path;
b. first mounting means connected to said laser beam transmitted for mounting said laser beam transmitter and directing means on one opposing wall of said building to direct a laser beam transmitted thereby toward the opposing wall of said building;
c. a retroreflector including means for mounting the same on the other opposing wall of said building in the path of said laser beam thereby causing said laser beam to be returned upon itself to the transmitter;
d. a detector responsive to forward and backward scattered light to provide a signal having a level which is proportional to the quantity of scattered light caused by any formed aerosol in the laser beam path, including second mounting means mounting the detector so as to be disposed to read scattered light in said laser beam;
e. logic means coupled to said detector for measuring the signal from the detector and for differentiating the signal to determine a rate of change in the quantity of scattered light;
f. an alarm system, coupled to said logic means; and
g. alarm operating means responsive to a predetermined rate of change in said logic means to operate said alarm system.

3,924,253
INDICATING SYSTEM USING PULSED OPTICAL TECHNIQUES

Francis C. Marino, Dix Hills, N.Y., assignor to Redactron Corporation, Hauppauge, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,846
Int. Cl.[2] G08B *13/18*
U.S. Cl. 340—258 B **5 Claims**



1. A light pulse generator comprising a reference potential means, a power supply, first and second serially connected current limiting resistors, the free end on said first current limiting resistor being connected to said power supply, a storage capacitor connected between the junction of said resistors and said reference potential means, a light emitting diode having one terminal thereof connected to the free end of said second current limiting resistor and a second terminal, a signal controlled switch for controllably connecting the other terminal of said light emitting diode to the reference potential means and having a control input, a uni-junction transistor having an emitter, and first and second bases, a load resistor having one end connected to the first of said bases, means for applying an operating potential between the second of said bases and the other end of siad load resistor, a timing resistor and a timing capacitor connected in that order between the other terminal of said light emitting diode and said reference potential means, means for connecting the junction of said timing resistor and timing capacitor to the emitter of said uni-junction transistor, and means for connecting the first base of said uni-junction transistor to the control input of said signal controlled switch.

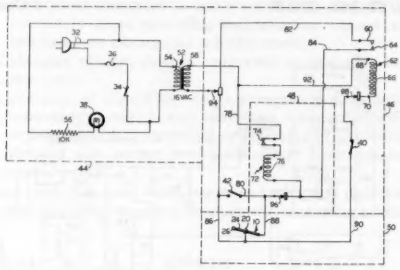
3,924,254
ANTI-INTRUSION ALARM SYSTEM

Franklin R. Klebold, 4103 E. Belknap, and Robert L. Bruce, 1604, both of Fort Worth, Tex. 76111

Filed Oct. 6, 1972, Ser. No. 295,436
Int. Cl. G08b *13/02*
U.S. Cl. 340—261 **15 Claims**

1. An anti-intrusion alarm system, consisting of; a power and anti-tampering unit, including a source of power, alarm means and a normally-closed switch means including holding means for holding said normally-closed switch means open when said holding means is energized; a remotely located detector unit including a motion-sensitive switch means; and cable means connecting said power and anti-tampering unit to said detector unit, including a first conductor leading from one contact of said motion-sensitive switch to a series combination of said alarm means and a first terminal of said power source in said power and anti-tampering unit, a second conductor leading from a second terminal of said power source to a second contact of said motion-sensitive switch, to complete a first circuit through said power source and said alarm means when said motion-sensitive switch is closed, and a third conductor leading from said second contact of said motion-sensitive switch to a series combination of said holding means and said first terminal of said power source, to complete a second

circuit to energize said holding means and hold said normally-closed switch open when said first conductor and said third conductor are intact and to deenergize said holding means and permit said normally-closed switch to close when said first or said third conductor are cut; and a third circuit within said



power and anti-intrusion unit including said power source, said alarm means and the contacts of said normally-closed switch, whereby said alarm means is energized when said holding means is deenergized and said normally-closed switch is closed.

3,924,255

EXPLOSION-PROOF TYPE SWITCH BOX WITH ALARM DEVICE

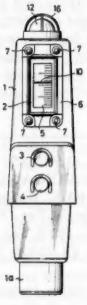
Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1973, Ser. No. 421,639

Claims priority, application Japan, July 13, 1973, 48-82339[U]

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—267 **2 Claims**



1. An explosion-proof switch box with an alarm device for indicating an operating condition of a machine, and comprising:

an explosion-proof body having a front surface with a window opening therein, a botton surface with a guide tube therein providing means for passage therethrough of an electrical connection between said body and a machine, and an upper surface having a hole therein;

a transparent plate positioned in said window opening;

an ampere meter positioned within said body adjacent said window opening and having a pointer visible through said transparent plate, said ampere meter being connectable to said machine;

first and second pushbuttons mounted in said front surface of said body;

first and second switch means, positioned in said body and connectable to said machine and connected respectively to said first and second pushbuttons, for respectively establishing and breaking electrical connection with said machine;

a relay circuit positioned in said body and connectable to said machine;

first light source means extending through said hole in said upper body surface for exhibiting light of a first color;

second light source means extending through said hole in said upper body surface for exhibiting light of a second color;

third light source means positioned behind said transparent plate for exhibiting light of said first color through said entire transparent plate;

fourth light source means positioned behind said transparent plate for exhibiting light of said second color through said entire transparent plate;

said first and third light source means being electrically connected in parallel to said relay circuit;

said second and fourth light source means being electrically connected in parallel to said relay circuit; and

detection means, operatively connected to said ampere meter and said relay circuit, for detecting first positions of said pointer indicative of a first range of operating conditions of said machine and generating a signal to cause said relay circuit to energize said first and third light source means and to deenergize said second and fourth light source means, and for detecting second positions of said pointer indicative of a second range of operating conditions of said machine and generating a signal to cause said relay circuit to energize said second and fourth light source means and to deenergize said first and third light source means.

3,924,256

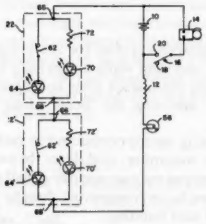
BURGLAR ALARM SWITCH

Morton H. Cohen, 4127 Westmoreland St., Little Neck, N.Y. 11363

Filed Jan. 8, 1974, Ser. No. 431,728

Int. Cl.[2] G08B *13/08*

U.S. Cl. 340—274 R **10 Claims**



1. A switch for a burglar alarm system which protects a closing member supported on a frame, said switch comprising:

a. a first housing adapted to be mounted on the frame and including: terminal means adapted to be interconnected within the burglar alarm circuit, and a series circuit combination of electrical contact means having a guarding position and an active position in series with a first light emitting means, said series circuit combination being inerconnected between said terminal means, and a circuit arrangement of impedance means and second light emitting means electrically connected to said impedance means for illuminating only when current passes through said impedance means, said series circuit combination and said circuit arrangement being connected in parallel circuit relationship; and

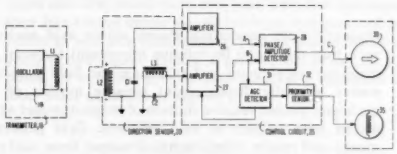
b. a second housing adapted to be mounted on the closing member and including control means for switching said

contact means for one of its positions to the other of its positions.

3,924,257
TRAILER HITCH GUIDE

Jack E. Roberts, La Grande, Oreg., assignor to Elmer B. Fatzer, Sun City, Ariz.

Filed June 21, 1973, Ser. No. 372,068
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—282 **6 Claims**



1. A guidance system for indicating the direction of relative movement and proximity of a towing vehicle to a towed vehicle comprising

coupling means for connecting the rearmost end of a towing vehicle to the forwardmost end of a towed vehicle, including a first coupling element on said towing vehicle and a second coupling element on said towed vehicle, whereby the position of said first coupling element with respect to said second coupling element changes with relative movement of said vehicles,

transmitter means positioned on said towed vehicle for transmitting a signal forwardly from said forwardmost end of said towed vehicle with a prescribed directional orientation with respect to said towed vehicle,

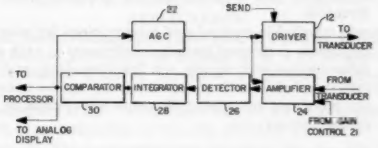
receiver means positioned on said towing vehicle for detecting the angular relationship and proximity of said receiver means to said transmitter means from the directional orientation of said transmitted signal, said receiver means including a direction sensor comprising first and second coils arranged transversely and in parallel to the longitudinal axis of said towing vehicle, respectively, first and second capacitors connected across said first and second coils, respectively, to form circuits therewith which are tuned to the frequency of the signal transmitted by said transmitter means, first and second amplifiers connected to said first and second coils, respectively, a phase-amplitude detector having first and second inputs connected to the outputs of said first and second amplifiers, respectively, and providing a first output signal having an amplitude and polarity indicative of the magnitude and direction of misalignment between the longitudinal axes of said towing and towed vehicles, an automatic gain control circuit connected to the output of said second amplifier for controlling the gain thereof, and a proximity detector connected to said automatic gain control circuit for providing a second signal indicating the proximity of said receiver means to said transmitter means by detecting the amplitude of the current derived from said second coil, and

indicator means connected to said receiver means for indicating the angular relationship between said vehicles and the proximity of said towing vehicle to said towed vehicle in response to the first and second signals derived from the output of said receiver means.

3,924,258
DIGITAL DEPTH SOUNDER

John T. Fowler, Winthrop, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 21, 1974, Ser. No. 453,553
Int. Cl.[2] G01S *9/68*
U.S. Cl. 340—3 R **10 Claims**



1. A depth sounder comprising:

counter means for providing successive counts during a predetermined timing cycle;

means for receiving echo pulses;

intermediate storage means coupled to said counter means; display storage means coupled to said intermediate storage means;

first transfer means operative in response to each received echo pulse during a single sounding interval to cause storage of the then count of said counter means in said intermediate storage means;

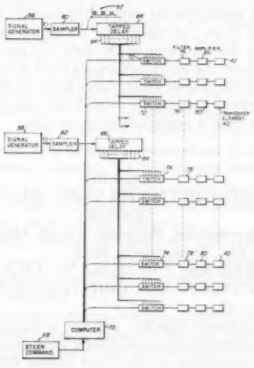
second transfer means operative in response to a signal representative of the end of a timing cycle to cause transfer of the then count in said intermediate storage means to said display storage means; and

display means operative to provide an output indication of the count stored in said display storage means and representative of bottom depth.

3,924,259
ARRAY OF MULTICELLULAR TRANSDUCERS

John L. Butler, Marshfield, and William M. Pozzo, North Easton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 15, 1974, Ser. No. 469,996
Int. Cl. H04b *11/00;* **H04r** *17/00*
U.S. Cl. 340—5 R **12 Claims**



1. A multiple frequency sound system comprising:

an array of transducer elements, each of said transducer elements having a substantially triangular shape, each of said transducer elements having a vertex formed by two sides of its radiating aperture, said transducer elements

being arranged in subgroupings within said array, the transducer elements in any one of said subgroupings being positioned with their respective vertices substantially contiguous, and each of said subgroupings being oriented within said array such that said subgroupings are contiguous to each other and each of said subgroupings is oriented such that corresponding transducer elements in each of said subgroupings are oriented in the same direction;

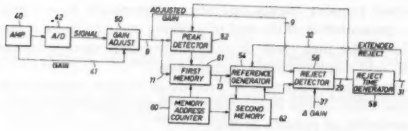
means coupled to each of said subgroupings for energizing oppositely positioned transducer elements in each of said subgroupings with signals at a first frequency; and

means coupled to each of said subgroupings for energizing the remaining transducer elements with signals at a second frequency.

3,924,260
METHOD AND APPARATUS FOR SUPPRESSION OF NOISE IN SEISMIC DATA

Robert M. Braham, and John W. Keowski, both of Houston, Tex., assignors to Petty-Ray Geophysical, Inc., Houston, Tex.

Filed June 27, 1974, Ser. No. 483,784
Int. Cl.² G01V 1/28
U.S. Cl. 340—15.5 GC **11 Claims**



1. A method of suppressing noise in seismic data wherein received seismic signals are amplified by sample normalizing amplifier means which outputs corresponding data and gain factor signals for recording to generate a seismic record, comprising the steps of:

receiving the gain factor output signals from the amplifier means a plurality of times during each discrete time increment of a seismic record time interval;

generating a reference gain factor for each of the discrete time increments responsive to each of the sampled gain factors;

comparing each sampled gain factor during subsequent time intervals to its corresponding reference gain factor; and blocking the recording of the data and gain factor signals output from the amplifier means for a sample time and a predetermined time thereafter whenever the corresponding reference gain factor exceeds the sampled gain factor by more than a predetermined amount.

3,924,261
DISPLACEMENT DETECTOR USING MAGNETOMETER SENSOR

Vahram S. Kardashian, Plymouth Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 3, 1971, Ser. No. 139,335
Int. Cl.² G01V 1/16; G01D 7/00; G01N 9/18
U.S. Cl. 340—17 **5 Claims**

1. A displacement detector utilizing a magnetometer operating in an inhomogeneous magnetic field created within the detector for providing an electrical output from the magnetometer which is a measure of displacement at the detector, comprising:

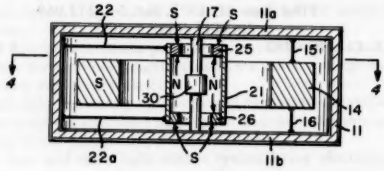
magnetic field generating means for generating an inhomogeneous magnetic field;

magnetic field shielding enclosure means comprising high permeability material for excluding the external magnetic field surrounding said magnetic field generating means;

magnetometer sensor means in said enclosure, said magnetometer sensor means including a driver coil energized by a high frequency current;

means rigidly positioning one of said magnetometer means and magnetic field generating means with respect to said enclosure;

suspension means fastened to said enclosure and non-rigidly suspending the other of said magnetometer means and

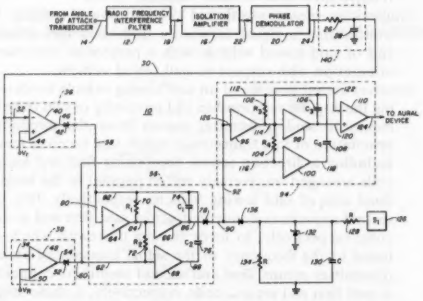


magnetic field generating means within said enclosure such that there can be relative movement between said magnetometer means and said magnetic field generating means whereby displacement causing motion of said enclosure causes relative motion of magnetometer sensor means with respect to said magnetic field generating means and results in an electrical output from said magnetometer indicative of said displacement.

3,924,262
AURAL WARNING APPARATUS

Lionel P. Melancon, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1974, Ser. No. 528,595
Int. Cl.² G08G 5/00
U.S. Cl. 340—27 AT **13 Claims**



1. An aural angle-of-attack warning circuit utilizing an a-c signal from an angle-of-attack transducer on an aircraft, the amplitude of said a-c transducer signal being proportional to the angle-of-attack of said aircraft, comprising:

a. first circuit means connected to receive said a-c signal for converting said a-c signal into a d-c signal proportional to said a-c signal's amplitude;

b. means for providing a first d-c reference voltage;

c. first switch means having a first and second input and an output, said second input being connected to receive said first d-c reference voltage, said first input being connected to receive said d-c signal, said first switch means being "on" when the voltage level of said first d-c reference voltage exceeds the voltage level of said d-c signal, said first switch means being "off" when the voltage level of said d-c signal exceeds the voltage level of said first d-c reference voltage;

d. means for providing a second d-c reference voltage, said second d-c voltage being greater in value than said first d-c voltage;

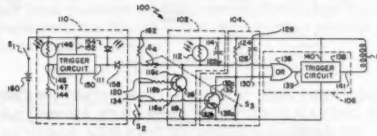
e. second switch means having a first and second input and an output, said second input being connected to receive said second d-c reference voltage, said first input being connected to receive said d-c signal, said second switch means being "on" when the voltage level of said d-c signal exceeds the voltage level of said second d-c reference voltage, said second switch means being "off" when the voltage level of said second d-c reference signal exceeds the voltage level of said d-c signal; and

f. second circuit means connected to said first and second switch means for generating a first tone burst aural driver signal when said first switch means is "off" and said second switch means is "off", for generating a second tone burst aural driver signal when said first switch means is "off" and said second switch means is "on," and for generating no first or second tone burst aural driver signal when said first switch means is "on," said first and second tone burst aural driver signals having a frequency of tone bursts as well as a tone frequency, said second tone burst aural driver signal having a greater frequency of tone bursts as well as a greater tone frequency than said first tone burst aural driver signal.

3,924,263
SHUTTER CONTROL CIRCUIT FOR A PHOTOGRAPHIC CAMERA

Robert V. Alessi, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 409,228, Nov. 24, 1973, Pat. No. 922,009. This application May 22, 1974, Ser. No. 472,405
Int. Cl.² G03B *7/08*
U.S. Cl. 354—50 **7 Claims**



5. In a camera having an aperture for exposing photographic film to scene light and actuatable means movable relative to the aperture between a light unblocking position and a light blocking position to regulate the amount of scene light impinging on such film, the improvement comprising exposure control apparatus for controlling the light regulating means comprising:

a. energizable means operably associated with said actuatable means for regulating movement of said actuatable means from its light unblocking position to its light blocking position to terminate a film exposure interval;

b. first timer means responsive to scene light for de-energizing said energizable means after an interval of time related to the intensity of scene light;

c. second timer means for de-energizing said energizable means after a predetermined interval of time that is independent of scene light intensity;

d. means associated with the initiation of the exposure interval for actuating said first timer means and said second timer means substantially simultaneously;

e. means for indicating the adequacy of scene light to effect a particular film exposure value within said predetermined interval of time;

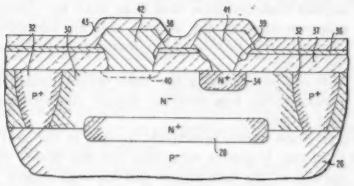
f. means responsive to said scene light indicating means for rendering said first timer means ineffective to de-energize said energizable means when said particular exposure value cannot be effected within said predetermined time interval; and

g. operatable switch means for overriding said scene light indicating means and said second timer means to permit said first timer means to operate said energizable means exclusively in accordance with the intensity of scene light.

3,924,264
SCHOTTKY BARRIER DEVICE AND CIRCUIT APPLICATION

Jack A. Dorler, Wappingers Falls; John L. Forneris, Peekskill, and Donald J. Swietek, La Grange, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 361,100, May 17, 1973, abandoned, which is a continuation of Ser. No. 209,958, Dec. 20, 1971, abandoned. This application July 15, 1974, Ser. No. 488,388
Int. Cl.² H01L *29/48, 23/48*
U.S. Cl. 357—15 **1 Claim**



1. In a high circuit density device fabricated by large scale integration techniques on a planar surface of a silicon semiconductor substrate,

said device having a plurality of circuit elements, said circuit elements including transistors, resistors, and Schottky Barrier diodes,

said substrate having a substantially planar surface, a thin layer of insulating material on said planar surface of said semiconductor substrate,

said thin layer of insulating material having a plurality of discrete windows, each of said windows of said thin insulating layer exposing a portion of said planar surface of said semiconductor substrate, each of said windows providing access to said circuit elements,

a first one of said plurality of windows exposing a first small surface area of said planar surface of said semiconductor substrate having N− type conductivity,

a second one of said plurality of windows exposing a second small surface area of said planar surface of said semiconductor substrate having N+ type conductivity,

said first and said second windows being closely displaced in space on said surface of said semiconductor substrate, wherein the improvement comprises:

interconnection metallurgy means for interconnecting said circuit elements, said interconnection means consisting essentially of an alloy of 95% by weight aluminum and 5% by weight copper,

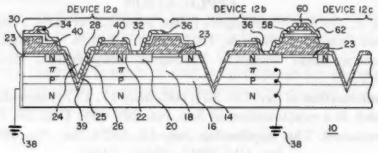
said interconnection means being superimposed on said thin insulating layer and integrally connected through each of said windows to said planar surface of said semiconductor substrate, whereby said first and second small surface areas of said planar surface of said semiconductor substrate respectively comprise the anode and cathode area of a Schottky Barrier diode, and

said Schottky Barrier diode is integrally connected to said circuit elements by said interconnections means consisting essentially of said alloy of aluminum and copper.

3,924,265
LOW CAPACITANCE V GROOVE MOS NOR GATE AND METHOD OF MANUFACTURE

Thurman John Rodgers, Palo Alto, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Aug. 29, 1973, Ser. No. 392,668
Int. Cl.[2] H01L *27/04, 29/78, 21/467*
U.S. Cl. 357—23 **15 Claims**

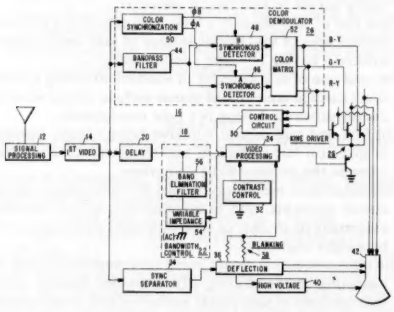


1. A field effect transistor device, comprising:
an n-type source having a donor dopant concentration of from about 10^{17} to about 5×10^{19} atoms per cubic cm and having a lower acceptor dopant concentration;
p-type base means overlying the source having an acceptor dopant concentration less than than the donor dopant concentration of the source and an acceptor dopant concentration profile which decreases with distance from the source;
a drift region overlying the base means having a dopant concentration less than the dopant concentration in the base means;
n-type drain means selectively located in the drift region;
at least one V groove extending into the device exposing a portion of the base means and the drift region;
an insulative layer overlying the exposed portions;
at least one conductor overlying at least a portion of the insulative layer; and
conductor means in electrical communication with the drain means.

3,924,266
AUTOMATIC LUMINANCE CHANNEL BANDWIDTH CONTROL APPARATUS RESPONSIVE TO THE AMPLITUDE OF COLOR IMAGE INFORMATION

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1974, Ser. No. 501,963
Int. Cl. H04n *9/02*
U.S. Cl. 358—38 **9 Claims**

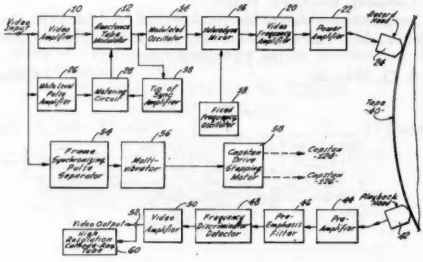


1. Apparatus for processing television video signals representing an image, said signals having at least a relatively wide bandwidth luminance signal portion, a relatively narrow bandwidth chrominance signal portion interleaved with said luminance signal portions, and color synchronization signal portions, comprising:
a source of video signals;
means coupled to said source of video signals for separating said chrominance signal portions from said luminance and synchronization signal portions and for generating from said chrominance signal portions a color information signal representing the amplitude of color information present in said image; and
a luminance signal channel coupled to said source of video signals for processing said luminance signal portions, said luminance signal channel including means responsive to said color information signal for varying the bandwidth of said luminance signal channel in inverse relationship to said amplitude of color information in said image.

3,924,267
SCAN CONVERTING VIDEO TAPE RECORDER

Norman I. Holt, East Pasadena, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Continuation of Ser. No. 668,116, Sept. 15, 1967, abandoned.
This application Oct. 27, 1971, Ser. No. 192,803
Int. Cl.[2] H04N *5/79*
U.S. Cl. 360—9 **11 Claims**

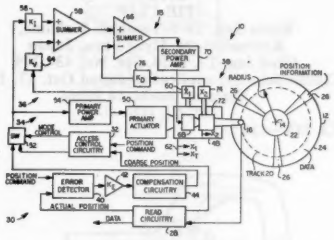


1. A magnetic tape recording apparatus for recording signals at a first scanning rate in a series of diagonal tracks extending across a magnetic tape and for playing back the recorded signals at a second scanning rate, said apparatus including:
means for guiding said tape in a helical path about a predetermined axis,
means for moving said tape in stepping increments through said helical path to provide successive intervals when said tape is stopped,
means for recording a line of signals diagonally across said tape when said tape is stopped including:
an electro-magnetic transducer record head, and
means for rotating said record head at a first rotational speed about said predetermined axis while in magnetically coupled relation with said tape as said tape is guided through said helical path; and
means for reproducing a previously recorded line of signals while said tape is stopped for recording icluding,
an electromagnetic transducer read head; and
means for rotating said read head at a second rotational speed higher than said first rotational speed about said predetermined axis while in magnetically coupled relation with said tape as said tape is guided through said helical path.

3,924,268
HIGH DENSITY TRACK FOLLOWER CONTROL SYSTEM FOR MAGNETIC DISK FILE

Robert P. McIntosh, Saratoga, Calif., and Hussein I. Shahein, Cairo, Egypt, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,612
Int. Cl.² G11B *21/08, 5/56*
U.S. Cl. 360—78 **18 Claims**

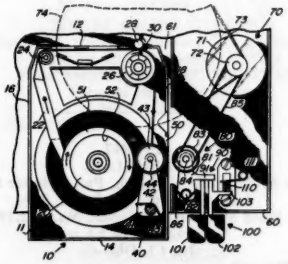


1. In a magnetic disk recording system having a radially positionable transducer head mounted on a secondary carriage which is radially movable with respect to a primary carriage which is in turn radially movable with respect to a magnetic disk, a transducer head position control system coupled to receive head position command information and actual head position information and control the movement of the primary and secondary carriages to position the head at a commanded position, the position control system being operable to simultaneously position both the primary and secondary carriages in response to a difference between actual and commanded head positions with the secondary carriage having a predetermined bias toward a zero displacement position with respect to the first carriage.

3,924,269
UNITARY POSITIONING ARM FOR SIDE DRIVE OF A CARTRIDGE TAPE PLAYER SYSTEM HAVING A REVERSE AND FAST FORWARD CAPABILITY

Edwin Stanley Bara, Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 5, 1974, Ser. No. 494,576
Int. Cl.² G11B *15/00;* **B65H** *17/48*
U.S. Cl. 360—93 **13 Claims**



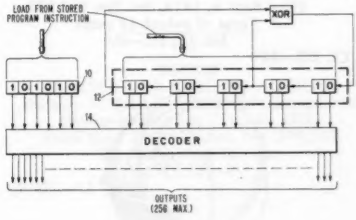
1. A cartridge tape player for a continuous loop cartridge having
- a casing having a first wall and a second wall and having an access opening in each of the walls,
- a hub means rotatably mounted in the casing, and
- a continuous loop tape wound on the hub means and adapted for being driven through the cartridge in a forward direction by being removed from the hub means at the inner convolution and returned to the hub means at the outer convolution,

wherein the tape player comprises
- a housing having a cartridge receiving cavity therein dimensioned to receive the casing,
- tape playing and driving instrumentalities including a capstan drive shaft mounted on the housing in communication with the cavity and adapted for coupling to the tape through the access opening in the first wall of the casing to drive the tape through the cartridge when the tape cartridge is fully inserted in the cavity during a first mode of operation of the player,
- drive means mounted in the housing,
- means mounted in the housing for coupling the drive means to the cartridge hub means through the access opening in the second wall of the casing for driving the tape through the cartridge during a second mode of operation during which the capstan drive shaft is uncoupled from the tape,
- means mounted in the housing for actuating the coupling means,
- the coupling means including
  - a unitary positioning arm having one end pivotably mounted in the housing,
  - a coupling member rotatably mounted to the other end of the positioning arm,
  - the positioning arm being movable between a first position in which the coupling member is disengaged from the hub means and a second position in which the coupling member is coupled to the hub means, and
  - means on the positioning arm cooperable with the actuating means for moving the positioning arm from the first to the second position,
  - whereby when the positioning arm is moved to the second position the tape is driven through the cartridge through the access opening in the casing side wall.

3,924,270
RECURSIVE SHIFT REGISTER FOR CONTROLLING A DATA PROCESSOR

Jerome Marvin Kurtzberg, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1974, Ser. No. 467,039
Int. Cl.² G06F *13/02*
U.S. Cl. 340—172.5 **8 Claims**



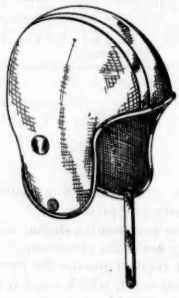
1. A digital data processor for executing a sequence of computer instructions comprising:
- storage means for maintaining digital information that can be accessed by said data processor;
- a recursive shift register means for providing as output a recursive digital word, which word is directly decodable as a machine executable instruction;
- means for incrementing said recursive shift register to produce a sequence of such recursive digital words;
- decoder means connected to said recursive shift register for decoding the digital word currently stored therein and providing signals to said data processor for controlling the execution of operations within said data processor.

DESIGNS

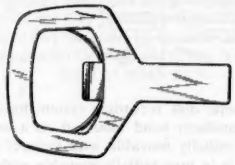
DECEMBER 2, 1975

237,843
FACE GUARD
Hugh T. Peterson, 1906 Kohl St. 19115, and Thomas M. Fallon, 4642 Kendrick St. 19136, both of Philadelphia, Pa.
Filed Apr. 22, 1974, Ser. No. 462,830
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233

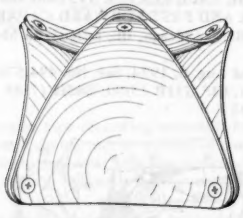
237,844
KNIT HELMET
Roy E. Stock, 6373 Teller St., Arvada, Colo. 80003
Filed Sept. 6, 1974, Ser. No. 503,973
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—249



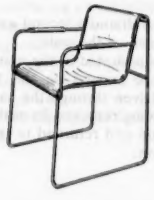
237,845
TIE CLIP
Keizo Saji, 14-6 Terabata 2-chome, Kawanishi-shi, Hyogo-ken, Japan
Filed Jan. 17, 1974, Ser. No. 434,279
Claims priority, application Japan Oct. 17, 1973
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—428



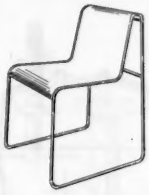
237,846
STOOL
Walter Zeischegg, Ulm, Germany, assignor to Hans-Friedrich Hefendehl, Kierspe, Germany
Filed Nov. 21, 1973, Ser. No. 417,748
Claims priority, application Germany May 24, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32



237,847
ARMCHAIR
William B. Sklaroff, Narberth, Pa., assignor to Tiffany Industries, Inc., St. Louis, Mo.
Filed Mar. 20, 1974, Ser. No. 452,793
Term of patent 14 years
Int Cl. D6—*01*
U.S. Cl. D6—69



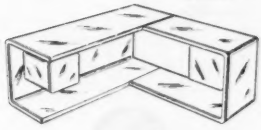
237,848
CHAIR
William B. Sklaroff, Narberth, Pa., assignor to Tiffany Industries, Inc., St. Louis, Mo.
Filed Mar. 20, 1974, Ser. No. 452,794
Term of patent 14 years
Int Cl. D6—*01*
U.S. Cl. D6—66



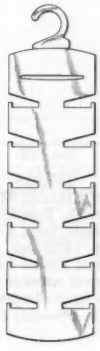
237,849
COOLING RACK
James M. Hale, Chicago, Ill., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 29, 1974, Ser. No. 465,392
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—142

237,850
BOMBE CHEST CABINET
Donald J. Booty, Frankfort, Ill., assignor to Amico, Inc., Philadelphia, Pa.
Filed Apr. 17, 1974, Ser. No. 461,677
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—149

237,851
L-SHAPED DESK
William B. Sklaroff, Narberth, Pa., assignor to Tiffany Industries, Inc., St. Louis, Mo.
Filed Mar. 20, 1974, Ser. No. 452,812
Term of patent 14 years
Int Cl. D6—*04*
U.S. Cl. D6—162



237,852
SUPPORT FOR NECKTIES, BELTS OR THE LIKE
Richard M. Aron, Stamford, Conn., assignor to M. Aron Corporation, New York, N.Y.
Filed Nov. 15, 1974, Ser. No. 524,139
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—251

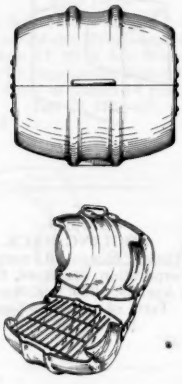


237,853
TUMBLER OR SIMILAR ARTICLE
Barbara E. Katz, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Sept. 20, 1973, Ser. No. 399,345
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—15

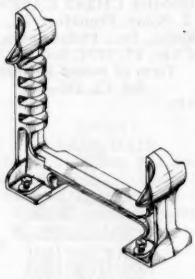
237,854
CANISTER WITH LID OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 27, 1973, Ser. No. 391,615
Term of patent 14 years
The term of this patent subsequent to May 13, 1989, has been disclaimed
Int. Cl. D9—*02;* D7—*07*
U.S. Cl. D7—79

237,855
CANISTER WITH LID OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 9, 1973, Ser. No. 404,770
Term of patent 14 years
The term of this patent subsequent to May 13, 1989, has been disclaimed
Int. Cl. D9—*02;* D7—*07*
U.S. Cl. D7—79

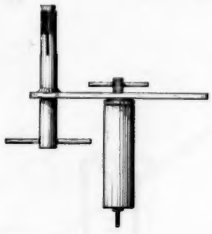
237,856
BARBEQUE GRILL
John R. Madson, 2064 S. 98th St. 53227, and Donald Habermehl, 5136 W. Plainfield Ave. 53220, both of Milwaukee, Wis.
Filed June 4, 1973, Ser. No. 367, 074
Term of patent 14 years
Int. Cl. D7—*02*; D7—*05*
U.S. Cl. D7—107



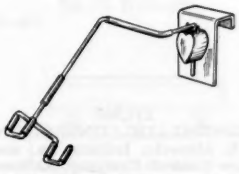
237,857
ANDIRON
James W. Welch, P.O. Box 455, Lake Stevens, Wash. 98258
Filed May 15, 1974, Ser. No. 470,178
Term of patent 7 years
Int. Cl. D7—*08*
U.S. Cl. D7—211



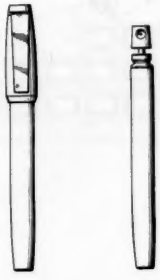
237,858
VALVE PULLING TOOL
Ezekiel Seminario, 15500 Tustin Village Way, Tustin, Calif. 92680
Filed Sept. 20, 1974, Ser. No. 507,820
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—59



237,859
BABY BOTTLE HOLDER
Anthony J. Ventimiglia, 24901 E. Jefferson, Apt. 202, St. Clair Shores, Mich. 48080
Filed July 30, 1973, Ser. No. 383,796
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D8—247



237,860
DISPENSING CONTAINER
Robert Shrier, 205 Northwest Terrace, Silver Spring, Md. 20901
Filed Sept. 21, 1973, Ser. No. 399,494
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—23

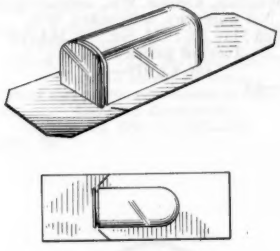


237,861
GLASS BOTTLE
Anthony T. Rossi, Bradenton, Fla., assignor to Tropicana Products, Inc., Bradenton, Fla.
Filed Aug. 14, 1974, Ser. No. 497,400
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44

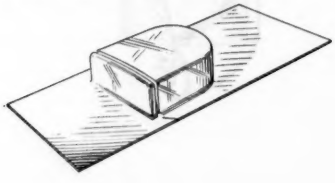
237,862
BOTTLE OR THE LIKE
James L. Westrich, Algoma, Wis., assignor to Algoma Net Company, Milwaukee, Wis.
Filed May 24, 1973, Ser. No. 363,760
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63

237,863
COMBINED BOTTLE AND CAP THEREFOR
Bernd Peters, Jesteburg, and Hermann G. Quack, Hamburg, Germany, assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 8, 1973, Ser. No. 339,031
Claims priority, application Great Britain Sept. 14, 1972
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

237,864
TEARABLE BLISTER PACKAGE
Eugene J. Meierhoefer, 48 Bald Eagle Road, Panther Valley, Hackettstown, N.J. 07840
Filed Sept. 28, 1973, Ser. No. 401,753
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—192

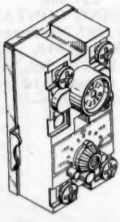


237,865
TEARABLE BLISTER PACKAGE
Eugene J. Meierhoefer, 48 Bald Eagle Road, Panther Valley, Hackettstown, N.J. 07840
Filed Sept. 28, 1973, Ser. No. 401,754
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—192

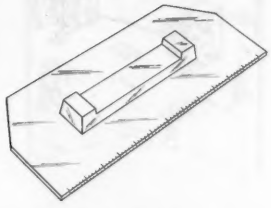


237,866
GAUGE FOR MEASURING WIND VELOCITY AND DIRECTION
Bo Gunnar Lonnstedt, Kvarnbergsvagen 23, S–141 45 Huddinge, Sweden
Filed Dec. 26, 1973, Ser. No. 427,445
Claims priority, application Sweden June 26, 1973
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—53

237,867
THERMOSTATIC CONTROL UNIT
Siegfried E. Manecke, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Aug. 21, 1974, Ser. No. 499,133
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50

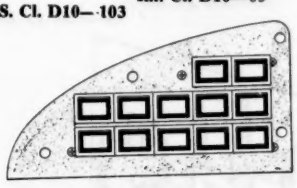


237,868
DRAFTING INSTRUMENT
Peter S. Hoagland, 18769 Saratoga, Lathrup Village, Mich. 48076
Original design application Dec. 15, 1971, Ser. No. 208,511, now Patent No. 232,051, which is a continuation-in-part of design application Ser. No. 160,234, July 6, 1971, now Patent No. 226,226. Divided and this application Jan. 2, 1974, Ser. No. 429,848
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62

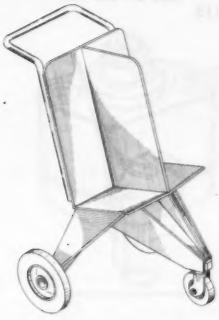


237,869
IMPACT MEASURING UNIT FOR KARATE TRAINING
Andrew S. Siroki, 428 S. 8th Ave., Highland Park, N.J. 08904
Filed Jan. 16, 1974, Ser. No. 433,810
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—83

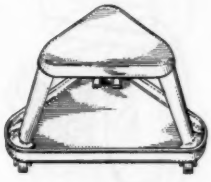
237,870
COMBINED AIRCRAFT ANNUNCIATOR WARNING LIGHT AND TEST PANEL
Louis D. Belloisy, Waterbury, and Donald P. Gover, Woodbury, Conn., assignors to James Di Rienzo and Louis D. Belloisy, fractional part interest to each
Filed Jan. 24, 1974, Ser. No. 436,143
Term of patent 7 years
Int. Cl. D10—*05*
U.S. Cl. D10—103



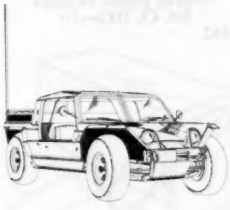
237,871
REPRODUCTION MACHINE STACKING CART
Jacob W. Patla, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 27, 1973, Ser. No. 428,936
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—26



237,872
MECHANIC'S ROLLER SEAT
Jack V. Miller, Sierra Madre, Calif., assignor to Orion Industries, Inc., Torrance, Calif.
Filed Oct. 23, 1974, Ser. No. 517,191
Term of patent 14 years
Int. Cl. D6—*01*; D12—*02*
U.S. Cl. D12—26



237,873
ALL-TERRAIN VEHICLE
Norman B. Johnson, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed July 2, 1973, Ser. No. 376,040
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—87

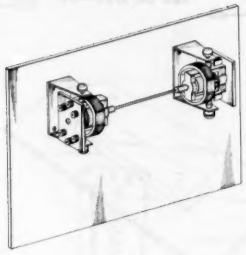


237,874
BICYCLE HOLDER
Robert E. Sill, 429 15th Ave. SW., Rochester, Minn. 55901
Continuation-in-part of abandoned design application Ser. No. 409,953, Oct. 26, 1973. This application Aug. 12, 1974, Ser. No. 496,822
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D12—115

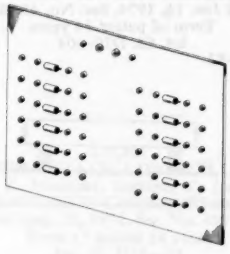
237,875
TIRE
Jean Bernard Montagne, Cebazat, France, assignor to Compagnie Generale des Etablissements Michelin, Raison Sociale Michelin & Cie
Filed Oct. 26, 1973, Ser. No. 410,081
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

237,876
MOTORCYCLE HITCH
Eddie R. McCrary, Rte. 1, Box 295A–7, Wylie, Tex. 75098
Filed Nov. 4, 1974, Ser. No. 520,570
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162

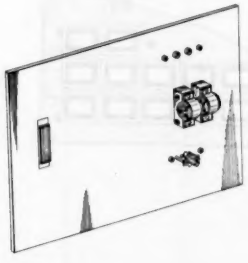
237,877
MOTOR AND GENERATOR EDUCATIONAL BOARD
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 19, 1973, Ser. No. 352,799
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



237,878
MULTI-METER EDUCATIONAL BOARD
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 27, 1973, Ser. No. 355,140
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



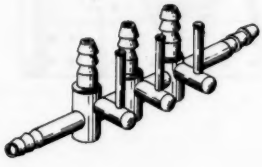
237,879
MAGNETISM AND INDUCTION EDUCATIONAL BOARD
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 19, 1973, Ser. No. 352,794
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



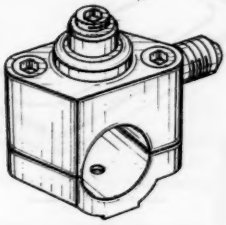
237,880
BASIC HAND TOOL EDUCATIONAL BOARD
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 19, 1973, Ser. No. 352,797
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

237,881
MINNOW NET
Rufus P. Steadman, 5726 Quince Road, Suite 16, Memphis, Tenn. 38117
Filed May 1, 1974, Ser. No. 465,886
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22

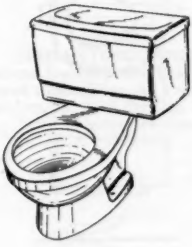
237,882
GANG VALVE
Tetsumi Yamasaki, 12–8 Sakae-Honmachi, Ikeda, Osaka, Japan
Filed May 6, 1974, Ser. No. 467,571
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



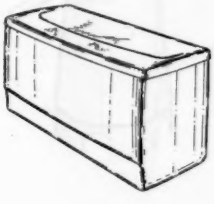
237,883
LINE TAP VALVE
Niklas F. Zetterberg, Topanga, Calif., assignor to Eugene T. McKinnon and Alvin S. Drutz, fractional part interest to each
Filed Apr. 10, 1974, Ser. No. 459,677
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



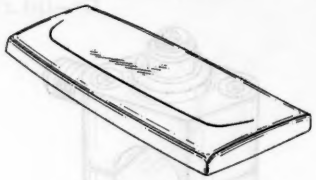
237,884
WATER CLOSET
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Sept. 26, 1974, Ser. No. 509,620
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—65



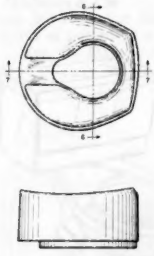
237,885
COMBINED WATER TANK AND COVER
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Sept. 26, 1974, Ser. No. 509,619
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—66



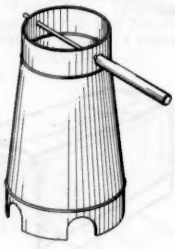
237,886
WATER TANK TOP
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Sept. 26, 1974, Ser. No. 509,621
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—66



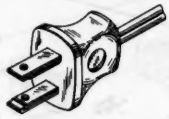
237,887
RAISED SUPERIMPOSED TOILET SEAT OR THE LIKE
Kurt Landsberger, 103 Harrison St., Verona, N.J. 07044
Filed July 15, 1974, Ser. No. 488,522
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



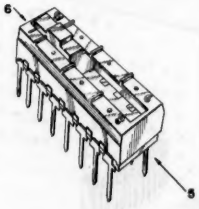
237,888
CHARCOAL FIRE STARTER
Charles J. Weidenborner, 130 Dobson Road, and Gerald M. Kryk, 137 Sheraton Drive, both of Rochester, N.Y. 14616
Filed Apr. 24, 1974, Ser. No. 463,743
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—90.1



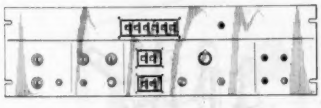
237,889
PLUG
George J. Lawrence, North Kingstown, and Lawrence P. Mellyn, Glocester, R.I., assignors to General Electric Company, New York, N.Y.
Filed Feb. 28, 1974, Ser. No. 447,121
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B



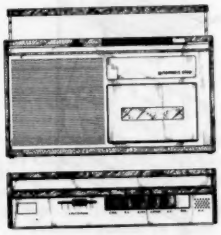
237,890
ELECTRICAL SWITCH
Nelson Frederick John Godfrey, Leighton Buzzard, England, assignor to ERG Industrial Corporation Limited, Dunstable, England
Filed May 4, 1973, Ser. No. 357,149
Claims priority, application Great Britain Feb. 23, 1973
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



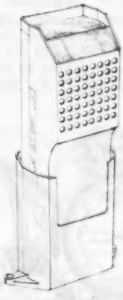
237,891
CONTROL PANEL FOR AN ELECTRONIC INVENTORY CONTROL SYSTEM
John Gault, Marlton, N.J., assignor to Video Systems Corp., Pennsauken, N.J.
Filed Nov. 28, 1973, Ser. No. 419,553
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 C



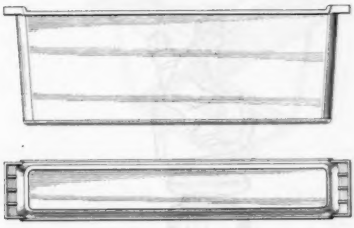
237,892
CASSETTE TAPE RECORDER
Peter Emmer, Buchenbronn, Germany, assignor to International Standard Electric Corporation
Filed Oct. 12, 1973, Ser. No. 405,968
Claims priority, application Germany Apr. 14, 1973
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



237,893
COMBINED WIRELESS TRANSMITTER-RECEIVER AND RECHARGER THEREFOR
Stig Wennerström, Villa Stig Inn, S–430 40 Saro, Sweden
Filed Mar. 7, 1974, Ser. No. 449,061
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K



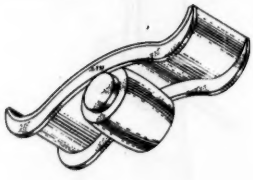
237,894
BEE FEEDER
Daniel A. Aten, Madera, Calif., assignor to Aten's Apiaries, Madera, Calif.
Filed June 6, 1974, Ser. No. 476,867
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



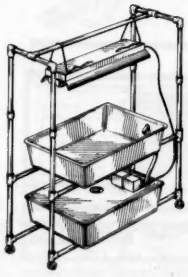
237,895
FIRE EXTINGUISHER
Louis F. Allen and Joseph B. Ott, Erie, Pa., assignors to Conwed Corporation, St. Paul, Minn.
Filed Aug. 22, 1973, Ser. No. 390,367
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D32—2

237,896
CHESS SET
David Swartwout, 8333 Niles Center Road, Skokie, Ill. 60076
Filed Sept. 27, 1972, Ser. No. 292,624
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH

237,897
ROLLER BOARD
Will Clarke England, 7310 Eastcrest, Austin, Tex. 78752
Filed May 24, 1974, Ser. No. 473,937
Term of patent 14 years
The term of this patent subsequent to Nov. 25, 1989, has been disclaimed
Int. Cl. D21—*01*
U.S. Cl. D34—5 K

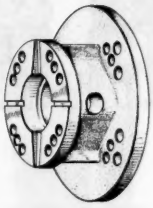


237,898
RACK MOUNTED HYDROPONIC TRAYS
Robert E. Austin, 2255 W. Wagon Wheel Drive 85021, and Greg W. Parks, 12634 N. 28th Way 85032, both of Phoenix, Ariz.
Filed June 3, 1974, Ser. No. 475,569
Term of patent 14 years
Int. Cl. D11—*02*; D15—*99*
U.S. Cl. D35—3 A



237,899
GUIDE LIGHT
Paul E. Rochford, East Greenwich, and Lawrence P. Mellyn, Glocester, R.I., assignors to General Electric Company, New York, N.Y.
Filed June 23, 1972, Ser. No. 265,816
Term of patent 14 years
Int. Cl. D11—*02*; D26—*05*
U.S. Cl. D48—20 E

237,900
ADAPTER FOR MOUNTING SPEED REDUCERS ON CONVEYORS
Richard B. Stroup, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.
Filed Nov. 7, 1974, Ser. No. 521,647
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 G

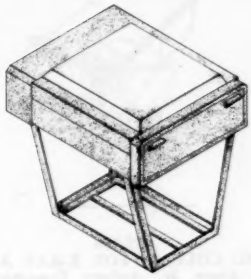


237,901
MIXING MACHINE
Keith Moran, 61 Guildford Road, Colchester, Essex, England, and Douglas Alan Michael Elston, 22 Desenfans Road, London SE. 21, England
Filed Sept. 21, 1973, Ser. No. 399,518
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D55—1 D

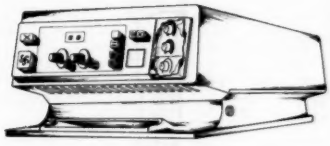
237,902
PAIR OF SPECTACLES
F. Forrest Eaton, Rochester, N.Y., and Richard R. Malese, Sturbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Apr. 25, 1972, Ser. No. 250,115
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

237,903
COMBINED SPECTACLE TEMPLE AND HEARING AID OR SIMILAR ARTICLE
Vittorio Giannetti, Rome Via Deruta 63, Rome, Italy
Filed Mar. 11, 1974, Ser. No. 449,853
Term of patent 14 years
Int. Cl. D16—*06;* D24—*99*
U.S. Cl. D57—1 A

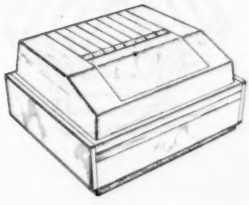
237,904
LITHOGRAPHIC PLATE DEVELOPER
Joseph J. Montefusco, Agawam, and Ferdinand Lukasik, South Hadley, Mass., assignors to City Machine Company, Inc., Holyoke, Mass.
Filed June 13, 1974, Ser. No. 479,249
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1 Q



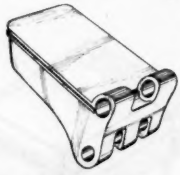
237,905
CONTROL PANEL FOR A COPIER
Ruediger W. Knodt, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 16, 1973, Ser. No. 342,242
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



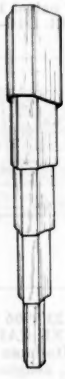
237,906
PRINTER CABINET
Arthur A. Hagstrom, Hoffman Estates, and Hans K. Keipert, Glenview, Ill., assignors to Teletype Corporation, Skokie, Ill.
Filed Oct. 4, 1974, Ser. No. 512,289
Term of patent 14 years
Int. Cl. D14—*02;* D18—*02*
U.S. Cl. D64—11 R



237,907
PISTON FOR ENGINE
Darrell V. Gilliland, 1068 Bell St., Reno, Nev. 89503
Filed Dec. 10, 1973, Ser. No. 423,497
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1 A

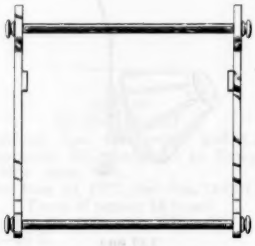


237,908
TELESCOPIC COLUMN FOR X-RAY APPARATUS
William H. Amor, Jr., Auburn Township, Robert J. Steffek, Wickliffe, and Kenneth E. Wagner, Richmond Heights, Ohio, assignors to Picker Corporation, Cleveland, Ohio
Filed Nov. 21, 1973, Ser. No. 418,054
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 H



237,909
INFANT NURSING BOTTLE
Tony Apilado, 28 W. 89th St., New York, N.Y. 10024
Filed Jan. 23, 1975, Ser. No. 543,503
Term of patent 14 years
Int. Cl. D9—*01*; D24—*04*
U.S. Cl. D83—8 A

237,910
HAND LOOM
Nickson R. Brubaker, 2232 Draper Ave. 55113; Peter J. Kreisman, 751 Goodrich Ave. 55105; and James C. Ingebretsen, 1761 Summit Ave. 55105, all of St. Paul, Minn.
Filed Dec. 3, 1973, Ser. No. 421,076
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D92—15



237,911
DRY SHAVER OR SIMILAR ARTICLE
Maarten Willem van Lelyveld, Drachten, and Knut Otto Yran, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 31, 1973, Ser. No. 393,473
Claims priority, application Switzerland Mar. 1, 1973
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

237,912
ELECTRIC SHAVER

Takeshi Takagi, Neyagawa-shi, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Kadoma-shi, Osaka, Japan

Filed July 30, 1974, Ser. No. 493,012
Claims priority, application Japan Feb. 8, 1974
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

237,913
DRY SHAVER OR SIMILAR ARTICLE

Aloysius Jacobus Maria Beeren, Nuenen, Netherlands, assiguor to U.S. Philips Corporation, New New York, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,798
Claims priority, application Switzerland Mar. 1, 1973
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Christiaens Societe Anonyme: *See—*
Vanhoof, Pierre M.; and Clarebout, Pierre M., 3,923,813.
Vanhoof, Pierre M.; and Clarebout, Pierre M., 3,923,887.
Vanhoof, Pierre Marie; and Clarebout, Pierre M., 3,923,815.

A. H. Robins Company, Incorporated: *See—*
Welstead, William John, Jr.; and Merriman, Burt Trosey, Jr., 3,923,988.

A/S Atlas: *See—*
Hovad, Helge, 3,923,097.

A-T-O Inc.: *See—*
McGill, Robert W., 3,922,836.

Aalpoel, Marten Geert, to Arenco-P.M.B. B.V. Device for cutting the sidewalls of a box for separating wholly or partly the lid from the box proper. 3,922,778, Cl. 30-2.000.

Aannemers, Combinatie Zinkwerken B.V.: *See—*
Nijdam, Ate, 3,922,865.

AB Tico: *See—*
Gustafsson, Karl Paul; and Frisk, Lars-Olov, 3,922,954.

AB Volvo: *See—*
Eker, Erik Per-Olof, 3,923,130.
Lindfors, Olov Halvar, 3,924,084.
Oksala, Aake Fritiof; Hultberg, Bror Arne Vilhelm; and Svensson, Sven Erik, 3,923,296.

Abbey, Harold G. Sealed slide plates for rotary internal combustion engine. 3,923,431, Cl. 418-61.00R.

Abbott Machine Co., Inc.: *See—*
Abbott, Samuel L., 3,923,263.

Abbott, Samuel L., to Abbott Machine Co., Inc. End finding air for winding machine. 3,923,263, Cl. 242-35.60R.

Abe, Kiyomi: *See—*
Sakai, Toshiyuki; Miyazaki, Kazuhide; and Abe, Kiyomi, 3,923,693.

Abele, Thomas G.: *See—*
Krebs, J. Robert; and Abele, Thomas G., 3,923,656.

Aberilla, William F. Compressed air cleaning tool. 3,922,753, Cl. 15-409.000.

Abernethy, Lynn W., to Stackpole Components Company. Keyboard switch. 3,924,089, Cl. 200-159.00R.

ACF Industries, Incorporated: *See—*
Diehl, Robert J.; and Guthrie, Larry E., 3,923,285.
Porter, David L.; and Williamson, Raymond E., 3,923,425.

Ackerman, William R., Jr., to W. R. Weaver Company. Adjustable base for mounting an optical firearm sight. 3,922,794, Cl. 33-248.000.

Addie, Lee W.; and Nikolaus, Harold W., to Armstrong Cork Company. Embossed needle-bonded fabric wall coverings. 3,924,040, Cl. 428-141.000.

Adler, Leonard, to Trace Metals Instruments, Inc.; and Itek Corporation. Apparatus and method for flame atomization. 3,923,398, Cl. 356-85.000.

Admiral Corporation: *See—*
Arneson, Blayne E., 3,924,067.

Advance Valve Installations Inc.: *See—*
Blazek, George A., 3,923,082.

AEG-Kanis Turbinenfabrik GmbH: *See—*
Kalb, Hans, 3,922,853.

AEG-Telefunken Kabelwerke Aktiengesellschaft: *See—*
Falke, Henning, 3,924,054.

Aerojet-General Corporation: *See—*
Kors, David L.; and Culver, Donald W., 3,922,849.

Aeroquip Corporation: *See—*
Allread, Alan R.; and Levering, Kenneth A., 3,923,080.

AGA Aktiebolaget: *See—*
von Krusenstierna, Otto, 3,923,550.

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Ahern, John F., Jr., to Itek Corporation. Nosepiece and nosepiece attachment for metal frames. 3,923,385, Cl. 351-132.000.

Aikoh Co., Ltd.: *See—*
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Albrecht, Harry Allen; and Plati, John Thomas, to Hoffmann-La Roche Inc. Sulfacytosine derivatives. 3,923,792, Cl. 260-239.750.

Albright, Jay Donald; Riggi, Stephen Joseph; and Shepherd, Robert Gordon, to American Cyanamid Company. Hypolipidemic 4-(monoalkylamino)benzoic acid derivatives. 3,924,001, Cl. 424-319.000.

Albright & Wilson Limited: *See—*
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Alert Control Company: *See—*
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Alessi, Robert V., to Eastman Kodak Company. Shutter control circuit for a photographic camera. 3,924,263, Cl. 354-50.000.

Alger, Donald L., to United States of America, General Counsel-Code GP. Deuterium pass through target. 3,924,137, Cl. 250-499.000.

Alger, James A.; and Miyata, John J., to VRC California, Inc. Method for making narrow track ferrite core flying pads. 3,922,776, Cl. 29-603.000.

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Allison, Danny R. Hi-line voltage breaker and fuse. 3,924,215, Cl. 337-190.000.

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Alpers, Frederick C., to United States of America, Navy. Aim point correlator. 3,923,273, Cl. 244-3.160.

Alt, Gerhard H.; and Howe, Robert K., to Monsanto Company. (Carboxybenzyl) trialkyl ammonium salts as plant growth regulants. 3,923,495, Cl. 71-111.000.

Altstadter Verpackungs Vertriebs GmbH: *See—*
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American Can Company: *See—*
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Anderson, Kenneth; and Brookes, Kenneth Arthur, to Associated Electrical Industries Limited. Electron microscopes. 3,924,126, Cl. 250-311.000.
Anderson, Paul L., to Sandoz Inc. Nitro substituted picolinonitriles as anti-bacterial and anti-fungal agents. 3,923,989, Cl. 424-263.000.
Ando, Hirohito; and Takagi, Kunihiko, to Dainippon Ink & Chemicals, Inc. Method for preparing isoindolenone pigments. 3,923,773, Cl. 260-152.000.
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Andrewsen, Harry W., to Chevron Research Company. Process for separating ethylene diamine from caustic and sodium chloride. 3,923,894, Cl. 260-583.00N.
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Aoki, Hatsuo; Hosoda, Junji; Komori, Tadaaki; Izeki, Manabu; Kubochi, Yoshiaki; Kamiya, Takashi; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Antibiotic FR-1923 substance. 3,923,977, Cl. 424-118.000.
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Argoudelis, Alexander D.; Coats, John H.; and Johnson, LeRoy E., to Upjohn Company, The. Composition of matter and process. 3,923,602, Cl. 195-80.00R.
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Arnn, Edward T. Biting screw driver. 3,923,088, Cl. 145-50.00A.
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Bara, Edwin Stanley, to Motorola, Inc. Unitary positioning arm for side drive of a cartridge tape player system having a reverse and fast forward capability. 3,924,269, Cl. 360-93.000.

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Barron, Daniel. Ship board sonar range computer. 3,923,243, Cl. 235-88.00R.

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Bate, Frederick Douglas Clavell. Packaging. 3,922,958, Cl. 93-33.00H.

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Bauer, Ralph L.: *See—*
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Baughman, Ray H.; and Yee, Kwok Chun, to Allied Chemical Corporation. Cyclically-bound ladder polymers of cyclic diacetylene tetramers. 3,923,622, Cl. 204-159.220.

Baukal, Werner; Kinkel, Heinz-Joachim; Robens, Erich; and Walter, Gerhard, to Battelle-Institut e.V. Carrier system for a drug with sustained release. 3,923,969, Cl. 424-19.000.

Bausch & Lomb Incorporated: *See—*
Brumley, Corwin H., 3,923,399.

Bavaro, Nicholas M.: *See—*
Newman, James W.; Bavaro, Nicholas M.; and Zajac, Ronald E., 3,923,270.

Bayer Aktiengesellschaft: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,923,818.
Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, 3,923,788.
Heins, Arnold; Blum, Helmut; and Worms, Karl-Heinz, 3,923,876.
Imre, Laszlo; Klein, Alfons; and Wedemeyer, Karlfried, 3,923,903.
Quiring, Bernd; Wagner, Kuno; Muller, Richard; and Muller, Peter, 3,923,743.
Roeder, Henning; Langner, Gunter P.; Scherhag, Bernd; Nickenig, Hans-Lothar; and Loix, Rene, 3,923,680.

Schaupp, Kurt; and Schulze, Manfred, 3,923,962.
Schneider, Kurt; Fahnler, Friedrich; Dhein, Rolf; and Heydenreich, Frieder, 3,923,925.
Schrock, Wilfried; Metzger, Karl-Georg; and Konig, Hans-Bodo, 3,923,789.
Weissel, Oskar; Metten, Josef; Schwarz, Hans Helmut; Koller, Horst; and Tacke, Peter, 3,923,695.
Wollweber, Hartmund; and Flucke, Winfried, 3,923,888.

BBC Brown Boveri & Company Limited: *See—*
Houska, Jaroslaw; and Strejcek, Jan, 3,923,232.

Beach, Janet. Biological specimen collectors and method. 3,923,040, Cl. 128-2.00F.

Beacham, Harry Hoyt: *See—*
Wright, Carl Leonard; and Beacham, Harry Hoyt, 3,923,929.

Beall, George H.: *See—*
Araujo, Roger J.; Beall, George H.; and Sawchuk, Loris G., 3,923,529.

Bean, Lloyd F., to Xerox Corporation. Migration imaging member and method. 3,923,504, Cl. 96-1.500.

Beard, Dale A., to General Motors Corporation. Oven temperature sensing circuitry. 3,924,101, Cl. 219-490.000.

Beaud, Jean-Louis. Apparatus for the treatment of parts by successive immersions in at least two baths. 3,923,072, Cl. 134-99.000.

Beck, Bruno: *See—*
Baerns, Manfred; Beck, Bruno; Schmid, Karl Ludwig; Machacek, Hubert; Beige, Gunther; and Nogge, Heinz, 3,923,867.

Becker, Carl: *See—*
Wegmann, Jacques; Becker, Carl; Zwahlen, Guenther; and Kuster, Werner, 3,923,452.

Beckers, Norman L., to Diamond Shamrock Corporation. Methylene chloride stabilized with ketones. 3,923,912, Cl. 260-652.50R.

Beckman Instruments, Inc.: *See—*
Ogle, David G.; and Taylor, John T., 3,922,957.

Beckmann, Georg; Gilli, Paul Viktor; Fritz, Kurt; and Lippitsch, Josef, to Waagner-Biro Aktiengesellschaft. Steam generators. 3,923,008, Cl. 122-34.000.

Becton, Dickinson and Company: *See—*
Ayres, Waldemar A., 3,922,917.

Bedenbender, John W.: *See—*
Kruppenbach, John A.; and Bedenbender, John W., 3,923,121.

Bedford, Alan D., to Hazeltine Research, Inc. Continuous information add-on system. 3,924,060, Cl. 178-5.600.

Beecham Group Limited: *See—*
Clayton, John Peter; and Hubbard, Ronald, 3,923,787.

Beekmans, Nicholaas Marinus; and Heijne, Leopold, to U.S. Philips Corporation. Apparatus for the measuring and supplying a controlled quantity of a gas. 3,923,624, Cl. 204-195.00S.

Beiersdorf Aktiengesellschaft: *See—*
Guse, Gunter; and Pietsch, Hanns Georg, 3,923,752.

Beige, Gunther: *See—*
Baerns, Manfred; Beck, Bruno; Schmid, Karl Ludwig; Machacek, Hubert; Beige, Gunther; and Nogge, Heinz, 3,923,867.

Bell, Glaister Steward; and Bauer, Jakob, to Varta Batterie Aktiengesellschaft. Elastic gas valve for galvanic cells. 3,923,548, Cl. 133-133.000.

Bell, John: *See—*
Knab, James V.; Haeckler, Charles; Bell, John; and Fellinger, Jerry, 3,923,482.

Bell, Stanley C.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; Bell, Stanley C.; and Rosenthale, Marvin E., 3,923,991.

Bell Telephone Laboratories, Incorporated: *See—*
Caldwell, James Lewis, 3,924,080.
Feldman, Martin; Rousseau, Denis Lawrence; Sinclair, William Robert; and Weick, Walter Werner, 3,924,093.
Gannett, Danforth K., 3,924,075.
Peterson, Eugene, 3,924,074.
Plourde, James Kevin, 3,924,208.
Sinha, Ashok Kumar, 3,923,559.

Bellina, Russell F., to Du Pont de Nemours, E. I., and Company. 1-Heterocyclic carbamoyl-N-carbamoyloxy formimidates. 3,923,786, Cl. 260-239.0BF.

Bellos, Thomas J.; and Bessler, Donald U., to Petrolite Corporation. Compositions useful in plugging formations. 3,923,100, Cl. 166-281.000.

Beloit Corporation: *See—*
Turcotte, Paul, 3,923,402.
Verseput, Herman Ward, 3,923,593.

Belsdorf, Manfred, to TRW Inc. Mechanism for fastening a ring on a shaft. 3,923,408, Cl. 403-261.000.

Bender, Albert; and Grimm, Hans, to Maschinenfabrik Gehring KG. Device for machining mantle surfaces. 3,922,819, Cl. 51-101.00R.

Bender, Paul E.; and Loev, Bernard, to SmithKline Corporation. Chroman and chromene compounds. 3,923,836, Cl. 260-345.200.

Bendix Corporation, The: *See—*
Chapelle, Walter E., 3,924,066.
Goodrich, George W., 3,924,228.
Keranen, Theodore W., 3,923,031.

Benedict, Robert P., to Westinghouse Electric Corporation. Steam turbine erosion reduction by ultrasonic energy generation. 3,923,415, Cl. 415-1.000.

Benefiel, Donald Clarence: *See—*
Parrott, Albert Ross; and Benefiel, Donald Clarence, 3,923,460.

Bengtsson, Bengt Lennart: *See—*
Bosund, Sven Ingmar Walton; and Bengtsson, Bengt Lennart, 3,924,005.

Benning, Charles W. Workmen's cage for excavation work. 3,922,866, Cl. 61-41.00A.

Benson, Gustav E.; and Yakuboff, Paul D., to Owens-Corning Fiberglas Corporation. Method for impregnating and coating fibrous strands. 3,924,028, Cl. 427-175.000.

Benz, Gerhard, to Minnesota Mining and Manufacturing Company. Process of making colored high temperature polymers. 3,923,726, Cl. 260-40.00R.

Berchielli, Aldo S., to Electrochem, Inc. Zinc electrode and method of making same. 3,923,544, Cl. 136-30.000.

Berg, Gerhard; and Nordsiek, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Process for the production of pourable, pulverulent rubbers. 3,923,707, Cl. 260-17.00R.

Berg, Harold Roy. Sliding door locking device. 3,922,893, Cl. 70-13.000.

Berg Manufacturing Company, The: *See—*
Klimek, Boleslaw; and Ma, James W., 3,923,346.

Bergfjord, John Alf; Grammatica, Steven James; and Radler, Richard William, to Xerox Corporation. Photoelectric and electrophotographic pigments comprising derivatives of condensed polycyclic aromatic hydrocarbon aldehydes. 3,923,506, Cl. 96-1.500.

Berghman, Thor Johan. Sealing strip. 3,923,411, Cl. 404-64.000.

Bergin, Michael J.; and Flaig, Richard, to Intaglio Service Corporation. Method of copper plating gravure cylinders. 3,923,610, Cl. 204-32.00R.

Bergloff, Raymond A., to United States of America, Army. Fluid expulsion system having a tapered tank. 3,923,208, Cl. 222-386.000.

Beriger, Ernest; and Pinter, Ladislaus, to Ciba-Geigy AG. 3-Hydroxymethacrylic acid methyl ester dimethyl thionosphosphate. 3,923,932, Cl. 260-941.000.

Berkes, John S.; Hillegas, William J.; and Ing, Samuel W., to Xerox Corporation. Image recording process. 3,923,512, Cl. 96-27.00R.

Berkowitz, Murray: *See—*
Hermes, Walter Ludwig; Berkowitz, Murray; and Lombaerde, Charles, 3,923,433.

Berlanga, Jose Maria Castellano: *See—*
Roldan, Cristobal Martinez; Brana, Miguel Fernandez; and Berlanga, Jose Maria Castellano, 3,923,820.

Bernard, John, Jr.: *See—*
Maxey, Robert E. L., Sr.; and Bernard, John, Jr., 3,922,791.

Bernardi, Herbert, to G.A.O. Gesellschaft fur Automation und Organisation m.b.H. Stepping drive. 3,922,926, Cl. 74-63.000.

Berry, Samuel M., to Commercial Metals Company. Precision bearing assembly. 3,923,350, Cl. 308-174.000.

Bersin, Richard L., to International Plasma Corporation. Dry plasma process for etching noble metal. 3,923,568, Cl. 156-8.000.

Bertolacini, Ralph J.; Gutberlet, Louis C.; and Kozinski, Allen A., to Standard Oil Company. Two-catalyst hydrocracking process. 3,923,638, Cl. 208-89.000.

Besser Company: *See—*
Woelk, Robert J., 3,923,451.

Bessler, Donald U.: *See—*
Bellos, Thomas J.; and Bessler, Donald U., 3,923,100.

Best, Desmond John: *See—*
Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, 3,923,788.

Bethlehem Steel Corporation: *See—*
Homberg, Otto A.; Sheldrake, Charles W.; and Lynn, James B., 3,923,957.
Humphries, Darral V., 3,923,945.

Bettencourt, Pierre Andre, to Wham-O Mfg. Co. Peepsight. 3,922,795, Cl. 33-254.000.

Bettonica, Luigi. Hydraulic press for the molding of tiles and plates of ceramic or like materials. 3,923,440, Cl. 425-167.000.

Beusink, Bernard Joseph, deceased (by Overkamp, Johanna Magaretha Maria Beusink nee, administratrix); Cuypers, Marinus Hubertus; and Horowitz, Alexandre, to Varitrac A.G. Method for the manufacture of driving belt packages. 3,922,771, Cl. 29-445.000.

Bevacqua, Louis Albert, to Motorola, Inc. Anti-backlash universal coupling. 3,922,883, Cl. 64-7.000.

Bianchini, Giacomo. Machine for the coupling of fabrics. 3,923,583, Cl. 156-378.000.

Bianco, Frank. Apparatus to assist fastening of an artificial limb. 3,922,727, Cl. 3-1.000.

Bidanset, Edward J., to Textron Inc. Band type brake for a chain saw. 3,923,126, Cl. 188-77.00W.

Biddick, Royce E.: *See—*
Margulies, Robert S.; and Biddick, Royce E., 3,923,545.

Big Drum, Inc.: *See—*
Miller, Joseph J., 3,923,200.

Billings, John C.: *See—*
Nastronero, John J.; and Billings, John C., 3,924,233.

Bilson, Edward A.: *See—*
Morris, Thomas M.; and Bilson, Edward A., 3,923,617.

Bingmann, Richard; Desiderio, Frank J.; and Edwards, Donald O'Neal, to General Electric Company. Compliance compensation for electronically controlled volume respirator systems. 3,923,056, Cl. 128-145.800.

Bird, Edwin Donald, to Keystone International, Inc. Boast assisted conveying system. 3,923,343, Cl. 302-24.000.

Birnbaum, Bruce H.: *See—*
Birnbaum, Richard S.; and Birnbaum, Bruce H., 3,923,316.

Birnbaum, Richard S.; and Birnbaum, Bruce H. Grass-ski. 3,923,316, Cl. 280-11.220.

Bissonette, Vernon Leon, to Eastman Kodak Company. Photographic process and composition employing CO(III) complexes and silver halide solvents. 3,923,511, Cl. 96-22.000.

Bixby, Leon C.: *See—*
Sparham, Vaughan R.; and Bixby, Leon C., 3,923,649.

Bjorksten Research Laboratories, Inc.: *See—*
Dunn, Stanley Austin, 3,924,098.

Blair, Peter Kenneth: *See—*
Earp, Charles William; Sandbank, Carl Peter; Overbury, Frances Giles; Barton, Paul; and Blair, Peter Kenneth, 3,924,236.

Blaise, Herman T.: *See—*
United States of America, National Aeronautics and Space Administration; Kugath, Donald A.; Dane, Dan H.; and Blaise, Herman T., 3,923,166.

Blake, William Wayne, to Caterpillar Tractor Co. Transmission control system with dual purpose modulating valve. 3,923,076, Cl. 137-495.000.

Blakeslee, Thomas R. Pulse code modulation time division multiplex telephone system. 3,924,077, Cl. 179-15.0AL.

Blankenbeckler, Ranzel. Door hanging device. 3,923,167, Cl. 214-1.00D.

Blazek, George A., to Advance Valve Installations Inc. Pipeline closure and method. 3,923,082, Cl. 138-89.000.

Blondel, Jacques: *See—*
Fache, Michel; Blondel, Jacques; and Mahieu, Jean-Rene, 3,924,204.

Bludworth, Robert A. Flexible coupled articulated vessel. 3,922,993, Cl. 114-235.00R.

Blue Bell, Inc.: *See—*
Fulp, James B., 3,922,980.

Blum, Dieter: *See—*
Gaeth, Rudolf; Hoelscher, Friedrich; Schmitt, Bernard; and Blum, Dieter, 3,924,033.

Blum, Helmut: *See—*
Heins, Arnold; Blum, Helmut; and Worms, Karl-Heinz, 3,923,876.

Blust, William F.: *See—*
Naber, Charles T.; and Blust, William F., 3,924,024.

Bochan, John; to General Electric Company. Suspension system for a washing machine. 3,922,892, Cl. 68-23.3.

Bock, Gustav; and Elser, Wolfgang, to BASF Aktiengesellschaft. Disperse dyes based on isoindolene derivatives. 3,923,806, Cl. 260-256.40C.

Bodlaj, Viktor, to Siemens Aktiengesellschaft. Process for measuring the distance of and the speed component of an object perpendicular to a reference line. 3,923,395, Cl. 356-4.000.

Boehringer Ingelheim GmbH: *See—*
Merz, Herbert; Langbein, Adolf; Walther, Gerhard; and Stockhaus, Klaus, 3,923,987.

Boeing Company, The: *See—*
Maroshick, Max, 3,922,971.

Boggild, Robert. Portable mount for gymnastic pole. 3,923,302, Cl. 272-60.00A.

Bolesta, Dmytro. Heating and cooling by separation of faster from slower molecules of a gas. 3,922,871, Cl. 62-5.000.

Boliden Aktiebolag: *See—*
Fiedler, Utz Gerhard, 3,923,478.

Boller, Arthur; and Scherrer, Hanspeter, to Hoffmann-La Roche Inc. Liquid crystal esters. 3,923,857, Cl. 260-465.00D.

Bollig, Georg; and Simons, Willi, to Schloemann-Siemag Aktiengesellschaft. Apparatus arranged after a continuous casting installation for releasing a thread-like casting connection. 3,923,092, Cl. 164-274.000.

Bonet, Claude; and Foex, Marc, to Agence Nationale de Valorisation de la Recherche (ANVAR). Production of ultra fine refractory particles from refractory material using plasma flows and a fluidized bed. 3,923,467, Cl. 23-293.00A.

Boot, Robert A.: *See—*
Cash, Carlton H.; Boot, Robert A.; Bauer, Ralph L.; and Husten, Benjamin F., 3,924,234.

Booth, William M.: *See—*
Rieth, James E.; and Booth, William M., 3,922,808.

Boranian, Armen G.; and Terwilliger, Bruce, to GAF Corporation. Floor tile production and products. 3,924,023, Cl. 427-54.000.

Borg-Warner Corporation: *See—*
Grant, Thomas S., 3,923,922.
Hechenbleikner, Ingenuin; and Enlow, William Palmer, 3,923,620.
Korol, Stanley F., 3,922,731.

Boris, Michel, to Societe Technique de Pulverisation. Liquid perfume atomizers. 3,923,250, Cl. 239-321.000.

Bornstein, Arthur N.; and Indig, Maurice E., to United States of America, Energy Research and Development Administration. High temperature aqueous stress corrosion testing device. 3,922,903, Cl. 73-15.600.

Boros, Paul Z.: *See—*
Tregay, John L.; and Boros, Paul Z., 3,924,061.

Bosch, Paul, to Robert Bosch G.m.b.H. Closed-circuit hydrostatic aggregate. 3,922,856, Cl. 60-464.000.

Bosse-Platiere, Michel J., to Schlumberger Technology Corporation. Well bore perforating apparatus. 3,923,106, Cl. 175-4.550.

Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 1,4-Dihydropyridines. 3,923,818, Cl. 260-294.80G.

Bostrom, Donald J.; and Moorad, Stanley, to Ekco Products, Inc. Package and method of forming same. 3,923,237, Cl. 229-43.000.

Bosund, Sven Ingmar Walton; and Bengtsson, Bengt Lennart, to Societe d'Assistance Technique pour Produits Nestle S.A. Soluble protein. 3,924,005, Cl. 426-7.000.

Bowerman, Edwin R., to GTE Laboratories Incorporated. Wedge reflector for fiber optic bundle. 3,923,375, Cl. 350-96.00C.

Bowman Enterprises, Incorporated: *See—*
Bowman, Vernon D., 3,923,956.

Bowman, Vernon D., to Bowman Enterprises, Incorporated. Smokeless anti-toxic burner method. 3,923,956, Cl. 423-210.000.

Boyer, Jean Paul. Endless film winding or unwinding device. 3,923,266, Cl. 242-55.160.

BP Chemicals International Limited: *See—*
Westlake, David Jack; and Wriglesworth, Michael John, 3,923,880.

Bradbury, Leslie John Stanley; and Wagner, Nicholas Liptay, to National Research Development Corporation. Anemometers. 3,922,912, Cl. 73-204.000.

Brady, Philip Ronald: *See—*
Eaton, John Richard; and Brady, Philip Ronald, 3,924,245.

Brady, William A.: *See—*
Reiner, Lawrence L.; and Brady, William A., 3,923,305.

Braham, Robert M.; and Keowski, John W., to Petty-Ray Geophysical, Inc. Method and apparatus for suppression of noise in seismic data. 3,924,260, Cl. 340-15.5GC.

Braithwaite, David G.; Cross, Carl F.; and Basila, Michael R., to Nalco Chemical Company. Hydrotreating catalyst. 3,923,691, Cl. 252-455.00R.

Braithwaite, David G.; Cross, Carl F.; and Basila, Michael R., to Nalco Chemical Company. Hydrotreating catalyst. 3,923,692, Cl. 252-455.00R.

Brana, Miguel Fernandez: *See—*
Roldan, Cristobal Martinez; Brana, Miguel Fernandez; and Berlanga, Jose Maria Castellano, 3,923,820.

Brandon, Clarence W., to Brandon, Orpha B., a part interest. Methods of well completion or workover of fluid containing subsurface formations. 3,923,099, Cl. 166-249.000.

Brandon, Orpha B.: *See—*
Brandon, Clarence W., 3,923,099.

Brandstatter, Horst. Home intercom telephone set. 3,924,073, Cl. 179-1.00H.

Brandstatter, Miroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Apparatus for controlling pattern drums particularly in circular knitting machines. 3,922,885, Cl. 66-50.00B.

Braun, David L., to Minnesota Mining and Manufacturing Company. Gas detection device. 3,924,219, Cl. 338-34.000.

Bray, James A.: *See—*
Smith, John R.; and Bray, James A., 3,923,471.

Bray Oil Company: *See—*
Wood, Jack E., 3,923,537.

Breland, Clinton Dale: *See—*
Petrey, Ernest Quentin, Jr.; and Breland, Clinton Dale, 3,923,954.

Brenan, Robert, to GTE Sylvania Incorporated. Method for making composite wire. 3,922,769, Cl. 29-420.500.

Breuer, Hans, to Carter-Wallace, Inc. Stable aerosol shaving foams containing mineral oil. 3,923,970, Cl. 424-47.000.

Brewer, Jack J., to Sam P. Wallace Company, Inc. Crane. 3,923,163, Cl. 212-54.000.

Bridigum, Robert J.: *See—*
Glass, William H.; and Bridigum, Robert J., 3,923,479.

Bridwell, John W.; Hopkins, Donald L.; and Lohbauer, Kenneth R., to Caterpillar Tractor Co. Hydraulic circuitry for an excavator. 3,922,855, Cl. 60-421.000.

Brindley, Robert E., to Union Carbide Corporation. Flashlight having a push button switch means. 3,924,116, Cl. 240-10.60R.

Brindley, Robert E., to Union Carbide Corporation. Flashlight having a magnet-switch combination. 3,924,117, Cl. 240-10.60R.

Bringe, Wolfgang: *See—*
Kaiser, Rudolf; Karcher, Werner; and Bringe, Wolfgang, 3,923,161.

Brinly-Hardy Co., Inc.: *See—*
Doering, Charles W., 3,922,744.
Doering, Charles W., 3,923,340.

Bristol-Myers Company: *See—*
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, 3,923,783.

British Oxygen Company Limited, The: *See—*
Armond, John Walter; and Webber, David Arthur, 3,923,477.

British Petroleum Company Limited, The: *See—*
Desty, Denis Henry; and Whitehead, David Montagu, 3,923,447.

Broadbent, Kent D., to MCA Disco-Vision, Inc. Disc record with skipped standard video increments and continuous audio increments and a method and apparatus for reproduction. 3,924,062, Cl. 178-6.60R.

Brochman, Wilfred R., to Minnesota Mining and Manufacturing Company. Stress-opacifiable tamper indicator. 3,923,198, Cl. 220-359.000.

Brock, James, to Imperial Chemical Industries Limited. Filament handling apparatus. 3,923,224, Cl. 226-7.000.

Brock, James Donald, to Astec Industries, Inc. Multistage oven with progressive circulation. 3,923,449, Cl. 432-59.000.

Brogan, Patrick J., to Imperial-Eastman Corporation. Tube fitting. 3,923,323, Cl. 285-3.000.

Brookes, Kenneth Arthur: *See—*
Anderson, Kenneth; and Brookes, Kenneth Arthur, 3,924,126.

Broughton, Clifton William; and Truemper, Joseph Tucker, to ICI United States Inc. Removal of iron contaminants from porous materials. 3,923,689, Cl. 252-444.000.

Brown, Fred C. Fender protector cloth with flexible magnetic strips. 3,924,212, Cl. 335-303.000.

Brown, Leanne M.: *See—*
Mazdiyasni, Khodabakhsh S.; and Brown, Leanne M., 3,923,675.

Brown, Roy A.; and Guzzetta, Franklin H., to Armco Steel Corporation. Method and apparatus for use in conjunction with electropainting a large number of small articles. 3,923,623, Cl. 204-181.000.

Bruce, Robert L.: *See—*
Klebold, Franklin R.; and Bruce, Robert L., 3,924,254.

Brumley, Corwin H., to Bausch & Lomb Incorporated. Miniaturized spectrophotometer. 3,923,399, Cl. 356-96.000.

Brunner, Helmut: *See—*
Schutte, Dieter; Diether, Jean; and Brunner, Helmut, 3,924,029.

Brunner, Robert E. Inflatable hanger. 3,923,212, Cl. 223-88.000.

Brunswick Corporation: *See—*
Meyer, James A., 3,922,996.
Russell, Jack A.; Pratt, Goodrich B.; and Gretzky, Anthony J., 3,924,122.

Bryan, Garry H.; Cleveland, Jesse M.; and Heiple, Clinton R., to United States of America, Energy Research and Development Administration. Method for preparing actinide nitrides. 3,923,959, Cl. 423-251.000.

Bubak, John: *See—*
Rusch, Allan C.; and Bubak, John, 3,923,129.

Buchan, William R.; Genthe, James E.; Mayer, Edward F.; and Moore, Robert A., to Itek Corporation. Electrophotographic copier. 3,923,392, Cl. 355-3.00R.

Budden, Robert G.; and Butlak, Eugene W., to Roberts-Gordon Appliance Corporation. Vibration cancelling burner grid for a heating system. 3,923,446, Cl. 431-114.000.

Buehlmann, Xaver: *See—*
Hess, Hans; Mueller, Guenther; and Buehlmann, Xaver, 3,923,599.

Buerger, Douglas Jay. Fabric fastener. 3,922,763, Cl. 24-246.000.

Buggele, Alvin E. Self-cleansing diffusion pump. 3,923,424, Cl. 417-55.000.

Bulantsev, Anatoly Andreevich; Galperin, Alexandr Lvovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Sakharov, Boris Alexandrovich. Apparatus for stopping a travelling wave loom upon its weft thread carriers having encountered an obstacle in the shed. 3,923,083, Cl. 139-12.000.

Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph. [N-Me-Ile^{1},Ile^{8}]-Angiotensin II as an angiotensin antagonist. 3,923,769, Cl. 260-112.500.

Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph. [Me$_2$Gly^{1}, Ile^{8}]-Anziotensin II as an angiotensin antagonist. 3,923,770, Cl. 260-112.500.

Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph. N-Guanidylacetyl-[des-asp^{1}-Ile^{8}] angiotensin II as an angiotensin antagonist. 3,923,771, Cl. 260-112.50R.

Burdett, Fred H.: *See—*
Pytel, Richard N.; Burdett, Fred H.; and Kozuch, Steve M., 3,923,488.

Burdi, Aldo J.; and Congleton, Robert S., to Itek Corporation. Optical warning system. 3,924,232, Cl. 343-6.00R.

Burdick, Robert E., to Rolair Systems, Inc. Device for translating and rotating a rocket motor or the like. 3,923,165, Cl. 214-1.0BE.

Burgess, Colin D.: *See—*
Wetherington, Thomas I., Jr.; Goode, McKay; and Burgess, Colin D., 3,922,876.

Burk, George A.: *See—*
Goralski, Christian T.; Burk, George A.; and Pews, R. Garth, 3,923,905.

Burke, Edward F., Jr., to Polaroid Corporation. Film strip cassette with moving processing fluid doctoring surface. 3,923,520, Cl. 96-78.000.

Burke, William F.: *See—*
Dixson, Bruce E.; Gayton, John E.; Lowery, Dennis J.; and Burke, William F., 3,922,909.

Burroughs Corporation: *See—*
Kronies, Reinhard Kurt, 3,924,241.

Bush Boake Allen Limited: *See—*
Jaggers, Brian George; Ufton, Keith Frederick; and Wagner, Horst Richard, 3,923,700.

Bussey, Christopher John, to Post Office, The. Apparatus for displaying an extreme value among a succession of digital values. 3,924,078, Cl. 179-15.0BF.

Butlak, Eugene W.: *See—*
Budden, Robert G.; and Butlak, Eugene W., 3,923,446.

Butler, James Edward: *See—*
Dunn, Robert Brian; and Butler, James Edward, 3,923,362.

Butler, John L.; and Pozzo, William M., to Raytheon Company. Array of multicellular transducers. 3,924,259, Cl. 340-5.00R.

Butler, Lee D.: *See—*
Wynn, Edward J.; and Butler, Lee D., 3,923,176.

Butwell, Robert J.; and Hunter, Gordon T., to Varian Associates. Electron beam amplifier tube with mismatched circuit sever. 3,924,152, Cl. 315-3.600.

Byk Gulden Lomberg Chemische Fabrik Gesellschaft: *See—*
Klemm, Kurt; and Langenscheid, Erhard, 3,923,817.

Byrd, Diane F.: *See—*
Ertingshausen, Gerhard; and Byrd, Diane F., 3,923,459.

C. L. Frost & Son, Inc.: *See—*
Frost, Charles C., 3,923,351.

C/M/S Marketing Corporation: *See—*
Sukys, V. John; Sukys, Julius P.; Edelmann, Harry E.; and Condon, Thomas E., 3,923,307.

Cacossa, Frank: *See—*
Guarino, Michael C.; and Cacossa, Frank, 3,922,830.

Cahn-Hidalgo, Gerardo R. A.; Castanon-Pasquel, Emilio; and Roldan, Jorge Del Rio. Educational game playing device. 3,923,306, Cl. 273-136.00A.

Caldwell, James Lewis, to Bell Telephone Laboratories, Incorporated. Zero suppression in pulse transmission systems. 3,924,080, Cl. 179-15.0BS.

Califano, Frank L.; and Shutak, Paul N., to Flintkote Company, The. Method for making tile products. 3,923,579, Cl. 156-263.000.

California Computer Products, Inc.: *See—*
George, David J., 3,924,146.

Caligiuri, Hugo J.: *See—*
Cohen, Allen; and Caligiuri, Hugo J., 3,924,130.

Calvert, Rodney K., to Mead Corporation, The. Article carrier. 3,923,236, Cl. 229-40.000.

Calviello, Joseph A., to Cutler-Hammer, Inc. Tantalum-gallium arsenide schottky barrier semiconductor device. 3,923,975, Cl. 427-84.000.

Camerman, Philippe Jean Andre, to Labofina S.A. Oxidation of diethylbenzenes. 3,923,909, Cl. 260-624.00R.

Camp, Carolyn J.; and Lindblom, Robert O., to Dow Chemical Company, The. Dielectric layer composition. 3,924,050, Cl. 428-413.000.

Campbell, Kenneth J. System for determination of small tuning errors in receivers. 3,924,189, Cl. 325-363.000.

Campbell, Robert W.; and Young, Robert E., to General Motors Corporation. Ignition distributor centrifugal advance mechanism. 3,923,028, Cl. 123-146.50A.

Canadian Ingersoll-Rand Company Limited: *See—*
Young, Douglas L. G., 3,923,087.

Canon Kabushiki Kaisha: *See—*
Inoue, Shozo; and Katayama, Hajime, 3,923,393.

Canron, Inc.: *See—*
Tyler, William J.; and Von Beckmann, Helmut, 3,922,969.

Cantarutti, Armindo: *See—*
Matsuoka, James T.; and Cantarutti, Armindo, 3,923,291.

Cante, Charles J.: *See—*
Lavo, Harry F.; and Cante, Charles J., 3,922,977.

Canter, James A., to General Motors Corporation. Evaporator fan delay circuit. 3,922,874, Cl. 62-155.000.

Canterbury, Bradford, to American Optical Corporation. Grinding method and coolant therefor. 3,922,821, Cl. 51-284.00R.

Carborundum Company, The: *See—*
Lawler, Harry A.; and Reys, John, 3,923,314.
Shaffer, Peter T. B., 3,923,629.

Carden, Danny P., to Southwire Company. Production of flooded multistrand cable. 3,923,003, Cl. 118-405.000.

Cardwell, Paul H.: *See—*
Kane, William S.; and Cardwell, Paul H., 3,923,615.

Carew, Victor E. Cab stacker and mobile work station. 3,922,941, Cl. 83-417.000.

Carey, Michael Albert, to Girling Limited. Vehicle dual braking systems. 3,922,857, Cl. 60-562.000.

Carlsen, Poul Frede, to F. L. Smidth & Co. Cement mill and method of starting same. 3,923,254, Cl. 241-30.000.

Carlson, Maurice F. Device for opening tear strip type containers. 3,923,194, Cl. 220-275.000.

Caron, Ronald N.: *See—*
Shapiro, Stanley; and Caron, Ronald N., 3,923,555.
Shapiro, Stanley; Pryor, Michael J.; and Caron, Ronald N., 3,923,558.

Carpenter, Louis M.; and Dunn, Kenneth L., to Carpenter Mfg. Co. Inc. Method and apparatus for stripping insulation from electrical conductors. 3,922,818, Cl. 51-40.000.

Carpenter Mfg. Co. Inc.: *See—*
Carpenter, Louis M.; and Dunn, Kenneth L., 3,922,818.

Carrara, Marcel V., to General Electric Company. Method of continuous casting. 3,924,036, Cl. 427-431.000.

Carrier Corporation: *See—*
Leonard, Louis H., 3,922,873.

Carson, John William, to Albright & Wilson Limited. Roadstone. 3,924,048, Cl. 428-404.000.

Carter, David P., to Hughes Aircraft Company. Simultaneous double crimp coaxial cable contact assembly. 3,923,367, Cl. 339-276.00R.

Carter, Donald Richard; Parkinson, Gerald Walter; and Cutting, Jack Robert, to United Technologies Corporation. Lightning protected composite helicopter blade. 3,923,421, Cl. 416-224.000.

Carter, Edward H., Jr.; and Holliday, Robert E., to Eastman Kodak Company. Substantially hexane soluble propylene/butene-1 copolymer containing 30 to 75 weight percent butene-1. 3,923,758, Cl. 260-88.200.

Carter-Wallace, Inc.: *See—*
Breuer, Hans, 3,923,970.

Case, Arol L. Rotary cooking device. 3,922,961, Cl. 99-427.000.

Cash, Carlton H.; Boot, Robert A.; Bauer, Ralph L.; and Husten, Benjamin F., to United States of America, Navy. Automatic active/passive fuze system. 3,924,234, Cl. 343-7.0PF.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 3,923,137.
Kashio, Toshio, 3,924,112.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Cornelius, Dieter; and von Brachel, Hanswilli, 3,923,455.
Ribka, Joachim; Piesch, Steffen; Engelhardt, Friedrich; Pfeiffer, Gerhard; Klinke, Peter; and Schidlo, Wolfram, 3,924,046.

Cassidy, John Edward, to Imperial Chemical Industries Limited. Cold-setting refractory compositions. 3,923,534, Cl. 106-62.000.

Castanon-Pasquel, Emilio: *See*—
Cahn-Hidalgo, Gerardo R. A.; Castanon-Pasquel, Emilio; and Roldan, Jorge Del Rio, 3,923,306.

Castleman, Curtis H., Jr.; and Cone, Irwin C., to Gates Rubber Company, The. Adjustable windshield wiper blade. 3,922,749, Cl. 15-250.420.

Catalano, Edward; and Ornellas, Donald L., to United States of America, Energy Research and Development Administration. Diffusion bonding of gold to gold. 3,923,231, Cl. 228-194.000.

Caterpillar Tractor Co.: *See*—
Blake, William Wayne, 3,923,076.
Bridwell, John W.; Hopkins, Donald L.; and Lohbauer, Kenneth R., 3,922,855.
Engel, Simon L.; and McFall, Robert A., 3,923,383.
Hansen, Howard A.; Fulton, Clyde E., deceased; Fulton, Minnie L., heir; and McCann, Brenda G., heir, 3,924,094.
Kershaw, Samuel L.; and Proeschl, Bernard E., 3,923,337.
Purcell, Robert J.; Balzer, David J.; and Van Zandt, Rollin P., 3,923,111.

Cates, Robert E., to Marley Company, The. Parallel air path wet-dry water cooling tower. 3,923,935, Cl. 261-159.000.

Caton, Dolphus D.; and Ralph, John R. Steering system for canoes and the like. 3,922,988, Cl. 114-165.000.

Caton, Michael Peter Lear; and Parker, Trevor, to May & Baker Limited. New cyclopentane derivatives. 3,923,872, Cl. 260-488.00R.

Catt, John D.: *See*—
Comer, William T.; and Catt, John D., 3,923,886.

Cavanagh, Leonard Alan, to Stanford Research Institute. Photographic detection and integration of light emitted from luminescent reactions. 3,923,462, Cl. 23-232.00R.

Cavenar, Clarence W., to W & Steel Co. Bar handling and length determining apparatus. 3,923,157, Cl. 209-73.000.

Caw Industries, Inc.: *See*—
Willard, John W., Sr., 3,923,456.

Celanese Corporation: *See*—
Gump, Klaus Hannes; and Stuetz, Dagobert Englebert, 3,923,950.
Jones, Rufus S., 3,923,750.
Powanda, Thomas W., 3,923,716.

Celmer, Walter D., to Pfizer Inc. Preparation of thioethers of rifamycin S and rifamycin SV. 3,923,791, Cl. 260-239.300.

Chacour, Selim A., to Allis-Chalmers Corporation. Hydraulic turbine installation and method of assembling the turbine headcover therein. 3,923,418, Cl. 415-219.00C.

Chagnaud, Paul: *See*—
Lamand, Michel; Lab nee Astier, Claudine; Roux, Remy; and Chagnaud, Paul, 3,923,982.

Chain-Lock Co., Inc.: *See*—
Greenebaum, Howard M., 3,922,895.

Chakrabarty, Ananda M.; Friello, Denise A.; and Mylroie, Joan R., to General Electric Company. Mercury concentration by the use of microorganisms. 3,923,597, Cl. 195-2.000.

Chakrabarty, Ananda M.; and Friello, Denise A., to General Electric Company. Discrete plasmid construction from chromosomal genes in pseudomonas. 3,923,603, Cl. 195-78.000.

Chalon, Jack, to Albert Einstein College of Medicine-Division of Yeshiva University. Anesthesia delivery system. 3,923,057, Cl. 128-188.000.

Chandler, Stephen. Fluid sampling device. 3,922,920, Cl. 73-422.0TC.

Chang, Kuang Y.; and Ferrell, Bonnie, to Syntex Corporation. Fatty alcohol-propylene carbonate-glycol solvent cream vehicle. 3,924,004, Cl. 424-358.000.

Channin, Donald Jones: *See*—
Duffy, Michael Thomas; Channin, Donald Jones; and Hammer, Jacob Meyer, 3,924,020.

Chant, John Bernard, to Vessa Limited. Joints for orthopaedic appliances. 3,923,047, Cl. 128-80.00F.

Chao, Stanley K.; and Eng, Albert, to Data Electronics Corporation. Switch assembly with reciprocating cams. 3,924,090, Cl. 200-159.00A.

Chapelle, Walter E., to Bendix Corporation, The. Orthoprinter using nadir line scanning. 3,924,066, Cl. 178-6.70R.

Chapman, Charles Wallace, to Charles W. Chapman (Consultants) Limited. Couplings. 3,922,884, Cl. 64-19.000.

Charles W. Chapman (Consultants) Limited: *See*—
Chapman, Charles Wallace, 3,922,884.

Chart, John Edward; and Knapp, Burton Bower, to International Nickel Company, Inc., The. Catalyst structure. 3,923,696, Cl. 252-467.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Berg, Gerhard; and Nordsiek, Karl-Heinz, 3,923,707.

Cheret, Jacques; Nouvet, Andre; and Cocoual, Noel. Metal screens used for industrial radiography. 3,924,127, Cl. 250-323.000.

Chevron Research Company: *See*—
Andrewsen, Harry W., 3,923,894.
Danzik, Mitchell; and House, Ralph, 3,923,856.
Hutchison, Stanley O.; and Mitchell, Neal L., 3,923,312.

Chiarino, Dario: *See*—
Della Bella, Davide; Gandini, Arnaldo; Chiarino, Dario; and Ferrari, Vittorio, 3,923,805.

Chicago Fire Brick Company: *See*—
Parsons, Joseph R.; and Rechter, Harold L., 3,923,531.

Chicago Pneumatic Tool Company: *See*—
Schaedler, Raymond J.; and Roth, Robert D., 3,923,429.

Chifos, Paul, to General Electric Company. Blade platform with friction damping interlock. 3,923,420, Cl. 416-190.000.

Chihara, Fumio: *See*—
Matsuura, Takashi; and Chihara, Fumio, 3,923,527.

Chihara, Shiro: *See*—
Nakajima, Nobuhiro; Nakatsugawa, Shiro; Koyama, Yasuo; and Chihara, Shiro, 3,923,978.

Chinuki, Takashi: *See*—
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,923,908.

Chisso Corporation: *See*—
Shirai, Isoo; Suzuki, Takeshi; and Tonooka, Koichi, 3,923,687.

Chivari, Ilie. Rotary speed for supplying fluid pressure to a clutch. 3,923,133, Cl. 192-85.00R.

Chlique, Bernard G., to Babcock & Wilcox, Limited. Industrial technique. 3,923,010, Cl. 122-483.000.

Choksi, Pradip V.; and Steidley, Roy B., to American Hospital Supply Corporation. Medical liquid container with tactile sterility indicator and method of testing container. 3,923,179, Cl. 215-203.000.

Choksi, Pradip V., to American Hospital Supply Corporation. Frangible closure system for medical liquid container. 3,923,182, Cl. 215-250.000.

Choksi, Pradip V.; and Steidley, Roy B., to American Hospital Supply Corporation. Container for medical liquid with separable outer and inner closures. 3,923,183, Cl. 215-251.000.

Choksi, Pradip V.; and Steidley, Roy B., to American Hospital Supply Corporation. Double screw cap system for sterile medical liquid container and method of opening same. 3,923,184, Cl. 215-251.000.

Choksi, Pradip V.; and Steidley, Roy B., to American Hospital Supply Corporation. Pouring container with double cap protector for sterile dispensing lip. 3,923,185, Cl. 215-253.000.

Chou, Tom M.: *See*—
Kennedy, Joseph P.; and Chou, Tom M., 3,923,759.

Christensen Diamond Products Company: *See*—
Cruickshank, James R.; and Jurgens, Rainer, 3,923,324.

Christman, Robert D.; McKinney, Joel D.; Readal, Thomas C.; and Yanik, Stephen J., to Gulf Research & Development Company. Hydrodesulfurization process with a portion of the feed added downstream. 3,923,637, Cl. 208-89.000.

Ciba-Geigy AG: *See*—
Beriger, Ernest; and Pinter, Ladislaus, 3,923,932.
de Montmollin, Rene; and Riat, Henri, 3,923,778.
Duennenberger, Max; and Schellenbaum, Max, 3,924,002.
Duerr, Dieter, 3,923,854.
Kabas, Guglielmo; Schlaepfer, Hans; and Fletcher, Ian John, 3,923,677.
Meyer, Hans Rudolf, 3,923,878.
Wegmann, Jacques; Becker, Carl; Zwahlen, Guenther; and Kuster, Werner, 3,923,452.

Ciba-Geigy Corporation: *See*—
Fattinger, Volker, 3,923,955.
Hess, Hans; Mueller, Guenther; and Buehlmann, Xaver, 3,923,599.
Huff, Roger K., 3,923,906.
Jost, Max; and Wick, Arnold, 3,923,727.
Pugin, Andre, 3,923,730.
Riccio, Pasquale R., 3,923,202.
Treichler, Hans-Joerg; and Nuesch, Jakob, 3,923,601.

Ciecluch, Ronald F.; and Schlein, Herbert N., to Polaroid Corporation. U.V. light absorbers in supports of integral diffusion transfer film units. 3,923,519, Cl. 96-77.000.

Cioni, Elisabetta; Cioni, Lucia; and Anichini, Rovena, widow Cioni. Machine for continuously washing open vials. 3,922,750, Cl. 15-302.000.

Cioni, Lucia: *See*—
Cioni, Elisabetta; Cioni, Lucia; and Anichini, Rovena, widow Cioni, 3,922,750.

Ciric, Julius, to Mobil Oil Corporation. Converting hydrocarbons with zeolite ZSM-4. 3,923,639, Cl. 208-111.000.

Cities Service Oil Company: *See*—
Dotson, Anderson O., Jr.; Newcombe, Jack; and Wolford, Lionel T., 3,923,734.

Citizen Watch Co., Ltd.: *See*—
Miyasaka, Kenzi; Takemoto, Mikio; Kato, Yoshiaki; Uematu, Hiroyuki; Tamaru, Munetaka; Kume, Kazunari; Ohno, Hideshi; and Onda, Mitsuo, 3,922,845.

Clarebout, Pierre M.: *See*—
Vanhoof, Pierre M.; and Clarebout, Pierre M., 3,923,813.
Vanhoof, Pierre M.; and Clarebout, Pierre M., 3,923,887.
Vanhoof, Pierre Marie; and Clarebout, Pierre M., 3,923,815.

Clark Equipment Company: *See*—
Hancock, James E., 3,923,322.

Clark, Harold V.; Skalon, Peter; and Emmons, Lawrence D., to Ampex Corporation. Three Phase brushless DC motor. 3,924,167, Cl. 318-254.000.

Clark, Michael J., to Dow Chemical Company, The. Briquetting calcium chloride particulate. 3,923,944, Cl. 264-109.000.

Clark, Ronald John; and Drummond, John Douglas, to Western Plaster Equipment Co. Ltd. Pumps. 3,923,428, Cl. 417-535.000.

Clason, Jan Christiaan, to Hazemeijer B.V. Vacuum circuit interruptor. 3,924,087, Cl. 200-144.00B.

Clayton, John Michael, to Norpak Machines Limited. Apparatus for closing of wrapping bags or sleeves. 3,922,834, Cl. 53-138.00A.

Clayton, John Peter; and Hubbard, Ronald, to Beecham Group Limited. α-Phosphinimine penicillins and their preparation. 3,923,787, Cl. 260-239.100.

Cleary, Thomas C.: *See*—
Lockyer, John; and Cleary, Thomas C., 3,924,178.

Clendinning, Robert A.; Potts, James E.; and Niegisch, Walter D., to Union Carbide Corporation. Biodegradable transplanter containers. 3,923,729, Cl. 260-40.00R.

Cleveland Hardware and Forging Company: *See—*
O'Brien, Raymond A., 3,923,662.

Cleveland, Jesse M.: *See—*
Bryan, Garry H.; Cleveland, Jesse M.; and Heiple, Clinton R., 3,923,959.

Clorox Company, The: *See—*
Fry, Raymond J.; and Andreasen, Michael W., 3,923,005.

Cloutier, Oscar F.; and Duncan, Charles P. Method and apparatus for use in making snow. 3,923,246, Cl. 239-2.00S.

Cloyd, Harold S., to Nosco Plastics, Inc. Omni directional tell tale tilt indicator. 3,923,000, Cl. 116-124.00R.

Cluett, Peabody & Co., Inc.: *See—*
Hughes, Francis H., 3,922,981.

Coaker, Antony W. M.; and Cowell, Elmer E., to Monsanto Company. Lubricated thermoplastic resin. 3,923,720, Cl. 260-31.20R.

Coats, John H.: *See—*
Argoudelis, Alexander D.; Coats, John H.; and Johnson, LeRoy E., 3,923,602.

Cochran, Michael J.; and Grant, Charles P., Jr., to Texas Instruments Incorporated. Calculator system featuring a subroutine register. 3,924,110, Cl. 235-156.000.

Cocoual, Noel: *See—*
Cheret, Jacques; Nouvet, Andre; and Cocoual, Noel, 3,924,127.

Coeurderoy, Yves G., to Societe Anonyme: Poclain. Hydraulic installation with energy storing means. 3,922,854, Cl. 60-413.000.

Coffen, David Llewellyn; and Katonak, David Allen, to Hoffmann-La Roche Inc. 6,7-Dihydropyrido[1,2-a]indol-9(8H)ones. 3,923,814, Cl. 260-293.530.

Coffey, Charles E.: *See—*
Atadan, Erdem M.; and Coffey, Charles E., 3,923,616.

Cohen, Allen; and Caligiuri, Hugo J., to United States of America, Navy. Body exposure indicator. 3,924,130, Cl. 250-342.000.

Cohen, Morton H. Burglar alarm switch. 3,924,256, Cl. 340-274.00R.

Colgate-Palmolive Company: *See—*
Perla, Giulio, 3,923,438.

Coll, Eugene: *See—*
Leonardo, Ignazio; and Coll, Eugene, 3,922,947.

Collins, David John; and George, Edwin Francis, to Imperial Chemical Industries Limited. Regulating plant growth with 7-methylindole. 3,923,492, Cl. 71-76.000.

Collins, Johnny; and Hendrickson, Melvin C., to Zenith Radio Corporation. Touch-tuning system for a television receiver. 3,924,191, Cl. 325-464.000.

Collins, Stephen M.: *See—*
Argade, Shyam D.; Collins, Stephen M.; and Armitage, James B., 3,923,630.

Colombo, Gianni: *See—*
Gassino, Teresio; and Colombo, Gianni, 3,924,105.

Colt Industries Operating Corporation: *See—*
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Columbia Steel Casting Co.: *See—*
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Combustion Power Company, Inc.: *See—*
Reese, Richard G., 3,922,975.

Comer, William T.; and Catt, John D., to Mead Johnson & Company. Sulfamides. 3,923,886, Cl. 260-556.00N.

Comercial Super-Dix, S.A.: *See—*
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Comfax Communications, Inc.: *See—*
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Command Engineering (International) Ltd.: *See—*
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Commercial Metals Company: *See—*
Berry, Samuel M., 3,923,350.

Commisso, Nicholas D.: *See—*
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Commonwealth Scientific and Industrial Research Organisation: *See—*
Weiss, Donald Eric; and Battaerd, Hendrik Adriaan Jacobus, 3,923,651.

Communication Equipment and Contracting Company, Inc.: *See—*
Pirnie, Robert M., III, 3,924,071.

Communications Satellite Corporation: *See—*
Lindmayer, Joseph; and Allison, James Frederick, 3,922,774.
Pentlicki, Chester John, 3,923,352.

Compagnie Honeywell Bull: *See—*
Rougon, Maurice Pierre Constant; and Davy, Gerald Albert Edmond, 3,923,360.

Conch International Methane Limited: *See—*
Tornay, Edmund George, 3,922,987.

Condolios, Elie; and Merle, Michel, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Method and apparatus for compacting fluid sludges. 3,923,652, Cl. 210-67.000.

Condon, Thomas E.: *See—*
Sukys, V. John; Sukys, Julius P.; Edelmann, Harry E.; and Condon, Thomas E., 3,923,307.

Cone, Irwin C.: *See—*
Castleman, Curtis H., Jr.; and Cone, Irwin C., 3,922,749.

Conger, Robert L.; Parks, John A.; and Long, Leslie T., to United States of America, Navy. Bomblet fuze system. 3,922,968, Cl. 102-70.20P.

Congleton, Robert S.: *See—*
Burdi, Aldo J.; and Congleton, Robert S., 3,924,232.

Conner, Algie J.: *See—*
Stine, Laurence O.; and Conner, Algie J., 3,923,686.

Conti, Cesare L. Eccentric-tip hooked needle for hosiery linking machines. 3,922,982, Cl. 112-222.000.

Continental Can Company, Inc.: *See—*
Roth, Donald J., 3,923,190.
Roy, Siegfried S., 3,923,209.

Continental Disc Corporation: *See—*
Solter, Robert L.; and Hansen, Franklin A., 3,922,767.

Continental Oil Company: *See—*
Durr, Albert M., Jr.; and Krenowicz, Robert A., 3,923,672.
Shock, D'Arcy A.; and Radd, Fred J., 3,922,863.

Conwed Corporation: *See—*
Wiegand, Donald E., 3,923,293.

Cook, Charles W., to Avco Corporation. Signal regenerator. 3,924,194, Cl. 328-164.000.

Cook, Homer Johnnie, to Du Pont de Nemours, E. I., and Company. Process for continuously preparing extrudable, crosslinkable polyethylene compositions. 3,923,947, Cl. 264-141.000.

Cooper Tire & Rubber Company: *See—*
Susko, James Alan, 3,923,390.

Coppens, Mattheus Johannes Martinus: *See—*
Zuideveld, Reinder; and Coppens, Mattheus Johannes Martinus, 3,922,984.

Copyer Co. Ltd.: *See—*
Ishida, Tsutomu, 3,923,298.

Corbin, Alan, to American Home Products Corporation. Process for treating neuroendocrinopathic diseases employing fluspirilene. 3,923,993, Cl. 424-267.000.

Cormier, Joseph T. Cable stripper. 3,922,779, Cl. 30-90.800.

Cornelius, Dieter; and von Brachel, Hanswilli, to Cassella Farbwerke Mainkur Aktiengesellschaft. Process of dyeing and printing synthetic hydrophobic materials with water-insoluble monoazo dyes. 3,923,455, Cl. 8-41.00B.

Cornell Research Foundation, Inc.: *See—*
Finn, Robert K.; Tannahill, Alex L.; and Laptewicz, Joseph E., Jr., 3,923,782.

Corning Glass Works: *See—*
Araujo, Roger J.; Beall, George H.; and Sawchuk, Loris G., 3,923,529.
Fischer, David J.; Kunz, Hans J.; and Norby, Thomas E., 3,923,625.
Hertl, William, 3,924,032.
Lachman, Irwin M., 3,923,667.
Marien, Jan A.; and Steinberg, David R., 3,922,773.
Randall, Eric N., 3,923,484.
Winkler, Ernel R., 3,924,221.

Cornish, Alan H.: *See—*
Davis, Robert B.; and Cornish, Alan H., 3,922,976.

Cornthwaite, Derek, to Imperial Chemical Industries Limited. Methanol synthesis catalyst. 3,923,694, Cl. 252-463.000.

Corod Manufacturing Ltd.: *See—*
Palynchuk, Alexander, 3,923,469.

Cortesi, Sergio Sandrolini: *See—*
Trentani, Claudio; and Cortesi, Sergio Sandrolini, 3,922,726.

Cosentino, Louis C.: *See—*
Stasz, Peter; and Cosentino, Louis C., 3,923,041.

Costantini, Michel; Crenne, Noel; Jouffret, Michel; and Nouvel, Jacques, to Rhone-Poulenc S.A. Preparation of cycloalkanones and cycloalkanols. 3,923,895, Cl. 260-586.00P.

Coulter, James R.: *See—*
Salzman, Gary C.; Coulter, James R.; Mullaney, Paul F.; and Hiebert, Richard D., 3,924,180.

Couvee, Cornelis: *See—*
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Cowden, Ernest A.: *See—*
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Coaker, Antony W. M.; and Cowell, Elmer E., 3,923,720.

Cox, Charles H., III. Heater remote control system. 3,924,120, Cl. 250-199.000.

Craft, Jack, to RCA Corporation. Electronic oscillator. 3,924,202, Cl. 331-111.000.

Craft, Lewis John; Roszyk, Leon M.; Stipanuk, John M.; and Szymczak, Eugene B., to Sunbeam Corporation. Mixer with speed control. 3,924,169, Cl. 318-354.000.

Cramm, Russell Henry: *See—*
Barron, Benny Gene; and Cramm, Russell Henry, 3,923,746.

Crask, Geoffrey J., to Hydril Company. Input signal powered converter. 3,924,251, Cl. 340-190.000.

Crawford, John. Overbased phenates. 3,923,670, Cl. 252-42.700.

Crawford, Wheller C.; Doyle, William P.; and Patterson, John A., to Texaco Inc. Michael-type addition products of nitroparaffins. 3,923,846, Cl. 260-404.000.

Crayton, John W.: *See—*
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Cremer, Rene: *See—*
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Crenne, Noel: *See—*
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Crescentini, Lamberto: *See—*
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Cresswell, Alan, to Decafix Limited. Liquid fuel atomizer. 3,923,248, Cl. 239-113.000.

Crisafulli, Angelo J. Oil skimmer with lead float and hinged weir. 3,923,661, Cl. 210-242.000.

Cross, Carl F.: *See—*
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Braithwaite, David G.; Cross, Carl F.; and Basila, Michael R., 3,923,692.

Crossley, Bernard Oliver: *See—*
Moore, Edwin Barclay; Crossley, Bernard Oliver; and Gladwell, Roy Leonard, 3,924,055.

Crow, Thomas G., to International Laser Systems, Inc. Laser apparatus employing mechanical stabilization means. 3,924,201, Cl. 331-94.50C.

Cruickshank, James R.; and Jurgens, Rainer, to Christensen Diamond Products Company. Drill collar with thread connections. 3,923,324, Cl. 285-16.000.

Crutchfield, Marvin M., to Monsanto Company. Method of making tetra sodium and tetra potassium 2,2,5,5-tetrahydrofurantetracarboxylate. 3,923,841, Cl. 260-347.300.

Csiki, Kalman; and Lundin, Rune, to Gullfiber AB. Comfort cushion for ear muffs, in particular sound shells. 3,922,725, Cl. 2-209.000.

Culley, Bobby Gene; and Kehren, Engelbert Wolfgang, to Texas Instruments Incorporated. VLED solid state watch. 3,922,847, Cl. 58-50.00R.

Culver, Donald W.: *See—*
Kors, David L.; and Culver, Donald W., 3,922,849.

Cunningham, James M.; Dorn, Kenneth A.; Howe, James A.; and Mortenson, Charles L., to Sperry Rand Corporation. Constant rise time controller for current pulse. 3,924,143, Cl. 307-263.000.

Curtis, Harris L., to Polaroid Corporation. Processes for synthesizing azo compounds. 3,923,779, Cl. 260-202.000.

Curtiss-Wright Corporation: *See—*
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Jones, Charles; Lamping, Harold D.; and Myers, David M., 3,923,012.
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Cushman Industries, Incorporated: *See—*
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Cutchaw, John M. Solar energy collector panel. 3,923,038, Cl. 126-271.000.

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Cutting, Jack Robert: *See—*
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Cuypers, Marinus Hubertus: *See—*
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Cyphelly, Ivan Jaroslav. Decanting centrifuge. 3,923,241, Cl. 233-7.000.

Dabby, Franklin Winston; and Smithgall, David Harry, Sr., to Western Electric Company, Incorporated. Coupling to graded index waveguide. 3,923,373, Cl. 350-96.0WG.

Dabrio, John W. Air metering valve for engine air inlet system. 3,923,024, Cl. 123-119.00B.

Dacons, Joseph C.: *See—*
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Sitzmann, Michael E.; and Dacons, Joseph C., 3,923,830.

Dahlem, Walter E. Automatic torquing tool. 3,922,935, Cl. 81-52.40R.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
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Dainippon Ink & Chemicals, Inc.: *See—*
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Daiwa Boseki Kabushiki Kaisha: *See—*
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Watanabe, Etsuji; Miyazaki, Tsutomu; Kato, Takashi; and Miyamoto, Noriaki, 3,922,840.

Dal Dan, Felice, to Etablissements Leonard S.A. Precision displacement measuring device for an electronic read-out platform scale. 3,923,110, Cl. 177-210.000.

Dale, Ernest A.; Dullea, Leonard V.; and Thomas, Martha J. B., to Sylvania Electric Products, Inc. Process for manufacturing phosphors. 3,923,682, Cl. 252-301.60P.

Dalgleish, Jack Frank, to Northern Electric Company Limited. Optical fibre connectors. 3,923,371, Cl. 350-96.00C.

Dalton, Everett L. Drawhead leveling device. 3,923,164, Cl. 213-75.00R.

Damsteeg, Cornelis Jan; and Ekkelboom, Tjepke Hendrik, to U.S. Philips Corporation. Soldered joint. 3,923,470, Cl. 29-191.000.

Danberg, Victor. Method of mixing solids and liquids on a continuous basis. 3,923,289, Cl. 259-22.000.

Dancy, William B., to International Minerals & Chemical Corporation. Production of phosphorus. 3,923,961, Cl. 423-323.000.

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Daniels, Henry L. Fuel atomizing device and vaporizer. 3,923,027, Cl. 123-141.000.

Dansk Industri Syndikat A/S: *See—*
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Danzik, Mitchell; and House, Ralph, to Chevron Research Company. Phosphate-free carboxylate-sulfate detergents. 3,923,856, Cl. 260-458.000.

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Data Electronics Corporation: *See—*
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David, Harry, to Hauni-Werke Korber & Co., KG. Packing machine for cigarettes or the like. 3,922,837, Cl. 53-234.000.

Davis, Curry Beach, to American Cyanamid Company. Extraction and recovery of cineole. 3,923,837, Cl. 260-345.200.

Davis, Jimmie L.; and Harris, Alfred C., Jr. Cultivator skimmer device. 3,923,103, Cl. 172-201.000.

Davis, Joseph R., to Research Corporation. 8,8-Dioxo-6,6-azopurine and method for preparing the same. 3,923,775, Cl. 260-154.000.

Davis, Robert B.; and Cornish, Alan H., to Koehler-Dayton, Inc. Sewage treatment system. 3,922,976, Cl. 110-9.00R.

Davis, Robert S.: *See—*
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Davis, William J.; Izbicki, Anthony J.; and Parsley, Johne, to MaTek Corporation. Method of forming an open-celled resilient capillary device. 3,923,936, Cl. 264-25.000.

Davy, Gerald Albert Edmond: *See—*
Rougon, Maurice Pierre Constant; and Davy, Gerald Albert Edmond, 3,923,360.

Dayton Rogers Manufacturing Co.: *See—*
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De Beers Industrial Diamond Division Limited: *See—*
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Dean, Lance L.: *See—*
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Dean, Leslie B., II; and Dean, Lance L. Take down back pack. 3,923,217, Cl. 224-9.000.

Decafix Limited: *See—*
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Della Bella, Davide; Gandini, Arnaldo; Chiarino, Dario; and Ferrari, Vittorio, to Whitefin Holding S.A. Propoxyphene derivative. 3,923,805, Cl. 260-253.000.

Delmag-Maschinenfabrik Reinhold Dornfeld: *See—*
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De Long, Ellis R. Twin-hulled outrigger sailboat. 3,922,994, Cl. 114-66.50R.

Deltrol Corporation: *See—*
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Delve, Malcolm Hoban: *See—*
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DeMarinis, Robert M.; and Hoover, John R. E., to SmithKline Corporation. Substituted sulfonylacetamido cephalosporins. 3,923,799, Cl. 260-243.00C.

de Montmollin, Rene; and Riat, Henri, to Ciba-Geigy AG. Disazo dyestuffs containing the α:β-dichloro- or α:β-dibromopropionylamino group. 3,923,778, Cl. 260-174.000.

den Admirant, Jacobus: *See—*
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Denis, Jean-Francois: *See—*
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De Nora, Vittorio; and De Nora, Oronzio, to Oronzio de Nora Implanti Elettrochimici S.p.A. Method of converting mercury cathode chlor-alkali electrolysis cells into diaphragm cells and cells produced thereby. 3,923,614, Cl. 204-99.000.

Denton Industries, Inc.: *See—*
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DePoorter, Gerald L.; and Rofer-DePoorter, Cheryl K., to United States of America, Energy Research and Development Administration. O^{18} Enrichment process in UO_2F_2 utilizing laser light. 3,923,619, Cl. 204-157.10R.

Derible, Pierre Henri; Lavaux, Jean-Paul; and Laurent, Jacques, to Roussel-UCLAF. Novel phenothiazines. 3,923,800, Cl. 260-243.00A.

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Desty, Denis Henry; and Whitehead, David Montagu, to British Petroleum Company Limited, The. Burner of use with fluid fuels. 3,923,447, Cl. 431-326.000.

Detrex Chemical Industries, Inc.: *See—*
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Dettre, Robert Harold; and Greenwood, Edward James, to Du Pont de Nemours, E. I., and Company. Aqueous dispersions of perfluoroalkyl esters and vinyl polymers for treating textiles. 3,923,715, Cl. 260-29.60R.

Deutsch Relays, Inc.: *See—*
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Deutsche Automobilgesellschaft mbH, Firma: *See—*
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Dexter, John B.; and Mann, Robert C., to United States of America, Navy. Ejector foot restrainer for bomb ejector unit. 3,923,275, Cl. 244-137.00R.

Dhaka, Vir A., to International Business Machines Corporation. Process for producing monolithic circuits. 3,923,562, Cl. 148-187.000.

Dhar, Ashok K.; DeWerd, Larry A.; and Stoebe, Thomas G., to United States of America, Health, Education and Welfare. Direct-response ultraviolet dosimeter utilizing thermoluminescent magnesium oxide. 3,924,135, Cl. 250-484.000.

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Diagravure Film Manufacturing Corporation: *See—*
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Diamond International Corporation: *See—*
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Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 3,923,910, Cl. 260-649.0DP.

Diamond Shamrock Corporation: *See—*
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Diaz Nogueira, Eduardo: *See—*
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Dick, Charles J., to Fuller Company. Method for cooling hot particulate material. 3,922,797, Cl. 34-20.000.

Dicker, Edward T. Construction method of assembling bagged, settable modules. 3,922,832, Cl. 52-742.000.

Dickinson, Harvey Frank, to Ferranti Limited. Means for determining the relative speeds of the input and output shafts of a gearbox. 3,922,910, Cl. 73-118.000.

Diehl, Robert J.; and Guthrie, Larry E., to ACF Industries, Incorporated. Stem connection for gate valves. 3,923,285, Cl. 251-200.000.

Diemer, Peter; Preusser, Gerhard; and Radusch, Paul, to Heinrich Koppers Gesellschaft mit beschrankter Haftung. Process for eliminating waste liquors accumulated in the desulfurization of coke oven gas. 3,923,965, Cl. 423-567.000.

Diesel Kiki Co., Ltd.: *See—*
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Diether, Jean: *See—*
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Dietterich, Charles W., to White-Westinghouse Corporation. Cabinet construction for a refrigerator. 3,923,355, Cl. 312-214.000.

Dildy, Clell A., Jr., to United States of America, Navy. Helium speech decoder. 3,924,069, Cl. 179-1.05H.

Dill, Walter R., to Halliburton Company. Method and composition for acidizing and fracturing wells. 3,923,666, Cl. 252-8.55C.

Dillard, John W., to Schlumberger Technology Corporation. Well bore perforating apparatus. 3,923,107, Cl. 175-4.550.

Di Martini, Carl R.; and Myers, Michael, to Asarco Incorporated. Filler solder. 3,923,501, Cl. 75-166.00C.

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Dimroth, Peter; and Schaffner, Ernst, to Badische-Anilin & Soda-Fabrik Aktiengesellschaft. Azo dye from an ortho-oxydiazolylaniline diazo component. 3,923,777, Cl. 260-157.000.

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Dixson, Bruce E.; Gayton, John E.; Lowery, Dennis J.; and Burke, William F., to Dixson, Inc. Fuel economy monitoring system for engines of vehicles. 3,922,909, Cl. 73-115.000.

Dixson, Inc.: *See—*
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Doemen, Benno, to Papst-Motoren KG. Speed control system for low speed brushless d-c motors. 3,924,166, Cl. 318-138.000.

Doering, Charles W., to Brinly-Hardy Co., Inc. Pick-up apparatus for debris collector. 3,922,744, Cl. 15-83.000.

Doering, Charles W., to Brinly-Hardy Co., Inc. Debris containing device. 3,923,340, Cl. 298-10.000.

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Domenico, Penelope B., to Dow Chemical Company, The. 6-Fluoro-3,5-dihalo-2-pyridinols. 3,923,822, Cl. 260-297.00R.

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Donn Products, Inc.: *See—*
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Donohue, Paul C. Pin cylinder litter collector. 3,923,101, Cl. 171-63.000.

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Dorler, Jack A.; Forneris, John L.; and Swietek, Donald J., to International Business Machines Corporation. Schottky barrier device and circuit application. 3,924,264, Cl. 357-15.000.

Dormans, Paul M., to Magnavox Company, The. Two-way cable television system with enhanced signal-to-noise ratio for upstream signals. 3,924,187, Cl. 325-52.000.

Dorn, Kenneth A.: *See—*
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Dornier System GmbH: *See—*
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Dorr, Wolfgang; Matzner, Hartwig; and Noska, Tilman, to Mannesmann Aktiengesellschaft. Method of supervising skin thickness in a solidifying body such as a continuously cast ingot. 3,923,091, Cl. 164-4.000.

Doshier, Kenneth E.: *See*—
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Downing, Lucien R., Jr., to Donn Products, Inc. Panel clip. 3,922,764, Cl. 24-259.000.

Doyle, William P.: *See*—
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Dozier, William A. Method for certifying dead cables or conductors by determining current pulse polarity. 3,924,179, Cl. 324-66.000.

Drabek, Stephen, to General Electric Company. Variable pitch fan for gas turbine engine. 3,922,852, Cl. 60-226.00R.

Dresser Industries, Inc.: *See*—
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Driessen, Fransiscus M.; Stadhouders, Jacobus J.; and Ubbels, Jacob, to Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek. Continuous preparation of fermented milk products. 3,924,007, Cl. 426-43.000.

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Dube, Rosario. Deionizing device for aerial electric lines. 3,924,058, Cl. 174-140.00R.

Dubois, Roger, to Huber & Co. Electromagnetic phono cartridge. 3,924,076, Cl. 179-100.41M.

Duennenberger, Max; and Schellenbaum, Max, to Ciba-Geigy AG. Method for combatting harmful microorganisms. 3,924,002, Cl. 424-331.000.

Duerr, Dieter, to Ciba-Geigy AG. Derivatives of thiocarbamic acid, their manufacture and their use for combating insects and representatives of the order acarina. 3,923,854, Cl. 260-455.00A.

Duffy, Michael Thomas; Channin, Donald Jones; and Hammer, Jacob Meyer, to RCA Corporation. Method of making an optical waveguide. 3,924,020, Cl. 424-162.

Dugan, James G.; Hancock, Albert S., Jr.; Huston, Kenneth G.; Rosenberg, Bernard L.; Smith, Shirley M.; and Hausske, Gene W., deceased (by Hausske, Martha J., executrix), to Robbins Incubator Co. Method and apparatus for incubating eggs. 3,923,006, Cl. 119-37.000.

Dujardin, Esther; Kuiper, Ysbrand; Cremer, Rene; and Sironval, Cyrille. Recording information by means of a photosensitive material of biological origin. 3,923,516, Cl. 96-48.00R.

Duling, Irl N.: *See*—
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Dullea, Leonard V.: *See*—
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Dumas, David H., to Hercules Incorporated. Water-dispersible thermosettable cationic resins and paper sized therewith. 3,923,745, Cl. 260-77.5CR.

Dumont, Rene; Goharel, Maurice; and Lafont, Jean-Claude, to Rhone-Progil. Method of treating the residues from the distillation of phthalic anhydride. 3,923,839, Cl. 260-346.700.

Duncan, Charles P.: *See*—
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Dunn, Robert Brian; and Butler, James Edward, to Northern Electric Company Limited. Wire connecting blocks. 3,923,362, Cl. 339-96.000.

Dunn, Stanley Austin, to Bjorksten Research Laboratories, Inc. Heating element, method and composition. 3,924,098, Cl. 219-345.000.

Dunne, Maurice J., to Unimation, Inc. Synchro-to-digital converter arrangement for manipulator apparatus. 3,924,230, Cl. 340-347.0SY.

Du Pont de Nemours, E. I., and Company: *See*—
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Bellina, Russell F., 3,923,786.
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van Stappen, Albert L., 3,923,515.
Vaughan, Lawrence G., 3,923,966.

Durr, Albert M., Jr.; and Krenowicz, Robert A., to Continental Oil Company. Turbine oil compositions. 3,923,672, Cl. 252-49.900.

Durrant, Oliver W.; and Walker, Robert R., to Babcock & Wilcox Company, The. Control system for a power producing unit. 3,922,859, Cl. 60-665.000.

Durst AG. Fabrik Fototechnischer Apparate: *See*—
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Duston, David Kenneth, to Espey Mfg. & Electronics Corporation. Laser smoke detection. 3,924,252, Cl. 340-237.00S.

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Eckerle, William A.; and Guth, Lauren W., to General Electric Company. Alternatively-mounted compactor door arrangement. 3,923,357, Cl. 312-274.000.

Eddy, Kenneth Harmon; and McGill, Kenneth Harmon, to Dresser Industries, Inc. System for erecting an oil well derrick. 3,922,825, Cl. 52-116.000.

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Eibl, Volker; and Reis, August, to Sachs-Systemtechnik GmbH. Method of and apparatus for disinfecting liquids by anodic oxidation with a silver anode. 3,923,632, Cl. 204-301.000.

Eichorn, Roger H., deceased; and Lincoln First Bank of Rochester, executor, to Xerox Corporation. Development and cleaning apparatus for reverse path machine. 3,923,004, Cl. 118-637.000.

Eilingsfeld, Heinz; Eisfeld, Wolfgang; Patsch, Manfred; and Schaffner, Ernst, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of chloroanthraquinone-2,3-dicarboxylic acid anhydrides. 3,923,838, Cl. 260-346.300.

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Ellinwood, Everett H., Jr. Apparatus and method for implanted self-powered medication dispensing having timing and evaluator means. 3,923,060, Cl. 128-260.000.

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EMI Limited: *See—*
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Ericsson, Sylve Jack Donald. Method for manufacturing a hollow-cylindrical body and a hollow-cylindrical body produced by said method. 3,922,772, Cl. 101-382.0MV.

Ertingshausen, Gerhard; and Byrd, Diane F., to Union Carbide Corporation. Process for the determination of bilirubin in fluids. 3,923,459, Cl. 23-230.00B.

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Estrada, Luis Alberto; and Wielt, Warren Pierce, to General Electric Company. Tieless bracing and method for supporting end turns of a dynamoelectric machine. 3,924,149, Cl. 310-260.000.

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Falbel, Gerald. Solar energy heating system. 3,923,039, Cl. 126-271.000.

Falke, Henning, to AEG-Telefunken Kabelwerke Aktiengesellschaft. Current conducting system having adjustable heat dissipation capability. 3,924,054, Cl. 174-15.00C.

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Fassett, Matthew, to Raytheon Company. Radio frequency attenuator comprising a plurality of variable phase shifters and serially coupled directional couplers. 3,924,206, Cl. 333-81.00R.

Fassy, Henri; Lalet, Philippe; and Miletto, Andre, to Societe Anonyme Ato Chimie. Adjuvant for improving the polymerisation of ethylene-hydrocarbons. 3,923,764, Cl. 260-92.80R.

Fattinger, Volker, to Ciba-Geigy Corporation. Process for deodorising waste or exhaust gases. 3,923,955, Cl. 423-210.000.

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Fielding, Harold Crosbie, to Imperial Chemical Industries Limited. Aliphatic compounds containing oxygen atoms. 3,923,902, Cl. 260-593.00H.
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Fracheboud, Michel G.: *See*—
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Franck, Jean-Pierre; Torck, Bernard; and Le Page, Jean-Francois, to Institut Francais du Petrole. Isomerization of saturated aliphatic and naphthenic hydrocarbons with a catalyst containing a hydrocarbylaromatic compound. 3,923,915, Cl. 260-666.00P.
Frank, Charles E.: *See*—
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Frankiewicz, Gerhard, to Agfa-Gevaert Aktiengesellschaft. Exposure apparatus for use in photographic copiers. 3,923,394, Cl. 355-37.000.
Franklin Institute Research Laboratories, The: *See*—
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Frant, Martin S.; Ross, James; and Riseman, John H., to Orion Research Incorporated. Method of detecting low levels of cyanide. 3,923,608, Cl. 204-1.00T.
Franz, Helmut, to PPG Industries, Inc. Method of fabricating a fluorocarbon-filled multiple glazed window unit. 3,923,485, Cl. 65-24.000.
Franz Morat GmbH, Firma: *See*—
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Frater, Georg; Greuter, Hans; and Schmid, Hans, to Hoffmann-La Roche Inc. Tricyclo(5.3.1.0^{5,8})undeca-5,9-dien-2-ones. 3,923,899, Cl. 260-586.00G.
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Fremont, Maurice, Henri, Louis; Denis, Jean-Francois; and Dzalba-Lyndis, Serve, Yvan, to Societe Nationale Industrielle Aerospatiale. Method of forming sandwich materials. 3,922,899, Cl. 72-128.000.
French, Carroll B.: *See*—
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Friedli, Hans R.: *See—*
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Fry, Raymond J.; and Andreasen, Michael W., to Clorox Company, The. Alfalfa-based animal litter, including starch. 3,923,005, Cl. 119-1.000.

Frye, George Joseph. Sound pressure box. 3,923,119, Cl. 181-.500.

Fuchs, Walter, to United States of America, Interior. Bed level monitor. 3,922,914, Cl. 73-290.00R.

Fuji Electrochemical Co., Ltd.: *See—*
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Fulton, Clyde E., deceased: *See—*
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Furuishi, Haruhisa; Murata, Yoshihiro; Suzaki, Hidenori; Sumoto, Misao; and Imanaka, Hiroshi, to Matsushita Electric Industrial Co., Ltd.; and Toyo Boseki Kabushiki Kaisha. Electrically heated alignment pad. 3,924,103, Cl. 219-528.000.

Furukawa, Jun-ichi; and Kono, Yoshinao, to Kao Soap Co. Ltd. Sizing agent for glass fibers. 3,923,708, Cl. 260-22.00R.

Furukawa, Yoshiyasu; Suno, Masahiro; and Nose, Sawami, to Takeda Chemical Industries, Ltd. 6-Aminouracil derivatives. 3,923,807, Cl. 260-256.40C.

Furuse, Takashi; Kamata, Sachio; Sekine, Kunio; and Sato, Koichi, to Dowa Mining Co., Ltd, The. Casting apparatus for casting large-sized ingots. 3,923,094, Cl. 164-337.000.

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Gaeth, Rudolf; Hoelscher, Friedrich; Schmitt, Bernard; and Blum, Dieter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the production of sheet materials with reversible absorptivity for moisture vapor. 3,924,033, Cl. 427-226.000.

GAF Corporation: *See—*
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Boranian, Armen G.; and Terwilliger, Bruce, 3,924,023.

Gahagan, Frederick G. Apparatus for inserting filling in bread. 3,923,437, Cl. 425-130.000.

Gale, Richard M.; Higgens, Calvin E.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A23187 and Process for preparation thereof. 3,923,823, Cl. 260-299.000.

Gales, Robert S.; and Harrah, Robert S., to United States of America, Navy. Wearable sound attenuating enclosure. 3,922,721, Cl. 2-2.00R.

Galperin, Alexandr Lvovich: *See—*
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Gandrud, Ebenhard S. Land measuring instrument. 3,922,793, Cl. 33-141.00E.

Gannett, Danforth K., to Bell Telephone Laboratories, Incorporated. Two-way privacy system terminal with single key pulse generator means. 3,924,075, Cl. 179-1.50R.

Gardner-Denver Company: *See—*
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Garver, Richard F., to B. F. Goodrich Company, The. Method and apparatus for building tires. 3,923,572, Cl. 156-128.000.

Gassino, Teresio; and Colombo, Gianni, to Tesalon Anstalt. Device for optically reading coded identity cards and the like. 3,924,105, Cl. 235-61.11E.

Gates, David S.: *See—*
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Gattuso, Marion J., to Universal Oil Products Company. Rubber formulations. 3,923,719, Cl. 260-30.80R.

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George, John Barrett, to RCA Corporation. Multiband random channel address crystal-lock tuning system. 3,924,192, Cl. 325-470.000.

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Gerber, Jean-Pierre; and Leimgruber, Jean-Daniel, to Zenith Time S.A. Date setting device of a calendar watch. 3,922,846, Cl. 58-58.000.

Gerster, John F., to Minnesota Mining and Manufacturing Company. Method for treatment of bacterial plant disease. 3,924,042, Cl. 424-258.000.

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Gillies, David; and Willis, Robert Anthony, to Stanhay (Ashford) Limited. Seed separator with adjustment for different seed sizes. 3,923,206, Cl. 222-371.000.

Gilligan, John E., to Alert Control Company. Throttle control device for motor vehicles. 3,923,020, Cl. 123-103.00C.

Gilman, Edwin. Magnetic permanent wave fastener. 3,923,068, Cl. 132-9.000.

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Gitlitz, Melvin H., to M & T Chemicals Inc. Certain triorganotin compounds used to combat plant fungi. 3,923,998, Cl. 424-288.000.

Given, Arthur P., to General Electric Company. System for controlling processing equipment. 3,924,240, Cl. 340-172.500.

GKN Transmissions Limited: *See—*
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Gladwell, Roy Leonard: *See—*
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Glastra, Hendrik, to N.V. Maatschappij voor Industriele Research en Ontwikkeling. Railway transportation system. 3,922,970, Cl. 104-91.000.

Glaze, Stanley George, to Lucas Aerospace Limited. Land vehicle wheel suspension arrangement. 3,923,240, Cl. 280-124.00F.

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Gnad, Josef: *See—*
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Gobran, Ramsis; Knoepfel, Hanspeter; and Silver, Spencer F., to Minnesota Mining and Manufacturing Company. Pressure sensitive adhesives of polymers of cycloaliphatic and phenylalkyl acrylates and vinyl esters. 3,924,043, Cl. 428-261.000.

Gobran, Ramsis; Knoepfel, Hanspeter; and Silver, Spencer F., to Minnesota Mining and Manufacturing Company. Sheet material coated with adhesives from cycloaliphatic and phenylalkyl acrylates and vinyl esters. 3,924,044, Cl. 428-355.000.

Goebel, Eickhart, to Gebr. Hofmann KG. Device for balancing unbalanced rotors in which the rotor can swing between horizontal and vertical positions. 3,922,922, Cl. 73-462.000.

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Goldkuhle, Werner P. Compaction system. 3,922,962, Cl. 100-53.000.

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Gordy, Robert S.; Sanders, David E.; and Anderson, Alfred T., to NCR Corporation. Staggered quadriphase differential encoder and decoder. 3,924,186, Cl. 325-30.000.

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Goswami, Sushil Kumar. Commutation circuits in inverter circuits. 3,924,173, Cl. 321-5.000.

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Green, Chester, to Hanscom, Genevieve I.; and Genevieve I. Hanscom, Robert Magnuson & Lois J. Thomson, Trustees of Roy M. Magnuson Estate, part interest to each. Shuffle feeder capable of single file advancement of articles. 3,923,143, Cl. 198-30.000.

Green, Cyril Robert. Cable spearing and cutting apparatus. 3,922,780, Cl. 30-92.000.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Fungicidal polymeric quaternary ammonium compounds. 3,923,973, Cl. 424-78.000.

Greenebaum, Howard M., to Chain-Lock Co., Inc. Showcase security system. 3,922,895, Cl. 70-100.000.

Greenfield, Harold; and Sekellick, Ronald S., to Uniroyal, Inc. Hydrogenation of benzonitrile to dibenzylamine. 3,923,891, Cl. 260-570.900.

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Gresley, James E.; and Glidewell, Hugh S. Hanger apparatus for supporting intravenous containers. 3,923,279, Cl. 248-318.000.

Gretzky, Anthony J.: *See—*
Russell, Jack A.; Pratt, Goodrich B.; and Gretzky, Anthony J., 3,924,122.

Greuter, Hans: *See—*
Frater, Georg; Greuter, Hans; and Schmid, Hans, 3,923,899.

Grihangne, Andre. Floating marine barrage. 3,922,861, Cl. 61-1.00F.

Grimm, Hans: *See—*
Bender, Albert; and Grimm, Hans, 3,922,819.

Gritzner, Gerhard, to Dow Chemical Company, The. Diaphragm cell chlorine production. 3,923,628, Cl. 204-237.000.

Gross, Franz, to Siemens Aktiengesellschaft. Delay line with low reflection attenuation for transit-time tubes. 3,924,151, Cl. 315-3.500.

Gross, Jerome A. Evacuable membrane apparatus for tire recapping. 3,923,586, Cl. 156-394.000.

Grossmann, Max: *See—*
Ong, Sienling; Grossmann, Max; and Karsunky, Ulrich, 3,923,457.

Grover, John Roger; Gayler, Ronald; and Delve, Malcolm Hoban, to United Kingdon Atomic Energy Authority. Reverse osmosis apparatus. 3,923,664, Cl. 210-321.000.

Groves, Henry William; and Yarnell, John, to Hawker Siddeley Dynamics Limited. Apparatus and method of determining flow. 3,922,911, Cl. 73-194.00A.

Groves, Richard B. Bag carrier. 3,923,222, Cl. 224-58.000.

Gruenman, Vsevolod; and Hoffer, Max, to Hoffmann-La Roche Inc. N-[(1-cyano-2-phenyl)ethyl]carbamates. 3,923,833, Cl. 260-340.500.

Gryazno, Georgy Mikhailovich: *See—*
Portnoi, Kim Isaevich; Arabei, Lidia Borisovna; Gryazno, Georgy Mikhailovich; Levi, Lev Izrailevich; Lunin, Gleb Leonidovich; Kozhukhov, Valery Mikhailovich; Markov, Jury Mikhailovich; and Fedotov, Mikhail Egorovich, 3,923,502.

Grylls, Frederick S. M., to Distillers Company (Yeast) Limited, The. Active dried yeast. 3,924,006, Cl. 426-24.000.

GTE Laboratories Incorporated: *See—*
Auborn, James J.; and Lieberman, Sheldon I., 3,923,543.
Bowerman, Edwin R., 3,923,375.

GTE Sylvania Incorporated: *See—*
Brenan, Robert, 3,922,769.
Shaffer, John W., 3,923,684.

Guarino, Michael C.; and Cacossa, Frank, to M. C. Guarino Associates, Inc. Adjustable modular partition. 3,922,830, Cl. 52-623.000.

Gueckel, Walter: *See—*
Synnatschke, Gotthard; Gueckel, Walter; and Rittig, Falk, 3,923,999.

Gulf Research & Development Company: *See—*
Christman, Robert D.; McKinney, Joel D.; Readal, Thomas C.; and Yanik, Stephen J., 3,923,637.
Kellum, Gene E.; and Gilbert, Ronald E., 3,923,767.
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Gullfiber AB: *See—*
Csiki, Kalman; and Lundin, Rune, 3,922,725.

Gump, Klaus Hannes; and Stuetz, Dagobert Englebert, to Celanese Corporation. Production of stabilized acrylic fibers and films. 3,923,950, Cl. 264-182.000.

Gunnergaard, Marius: *See—*
Jorgensen, Hemming Kristian; and Gunnergaard, Marius, 3,923,095.

Gunning, Raymond Harry; and Lubbock, Frederick John, to Dulux Australia Ltd. Process for making porous polyester granules. 3,923,704, Cl. 260-2.50N.

Guse, Gunter; and Pietsch, Hanns Georg, to Beiersdorf Aktiengesellschaft. Pressure sensitive adhesives from diesters of fumaric acid and vinyl compounds copolymerizable therewith. 3,923,752, Cl. 260-78.50E.

Gustafsson, Karl Paul; and Frisk, Lars-Olov, to AB Tico. Load-sensing and pressure-limiting device with accelerated tripping. 3,922,954, Cl. 91-412.000.

Gutberlet, Louis C.: *See—*
Bertolacini, Ralph J.; Gutberlet, Louis C.; and Kozinski, Allen A., 3,923,638.

Guth, Carl R. Fuel mixing chamber for welding and cutting torches. 3,923,448, Cl. 431-354.000.

Guth, Lauren W.: *See—*
Eckerle, William A.; and Guth, Lauren W., 3,923,357.

Guthrie, Larry E.: *See—*
Diehl, Robert J.; and Guthrie, Larry E., 3,923,285.

Guzzetta, Franklin H.: *See—*
Brown, Roy A.; and Guzzetta, Franklin H., 3,923,623.

H. J. Langen & Sons Ltd.: *See—*
Langen, Marinus J. M., 3,923,144.

Haase, Jan Raymond, to Eastman Kodak Company. Fogged direct positive silver halide emulsions containing photographic sensitizing dyes derived from substituted salicylaldehydes. 3,923,524, Cl. 96-140.000.

Hadamard, Gilbert, to International Business Machines Corporation. Method for testing logic chips and logic chips adapted therefor. 3,924,144, Cl. 307-303.000.

Hadaway, Bernard Milton, to Repço Research Propietary Limited. Fluid seal. 3,923,315, Cl. 277-134.000.

Haeckler, Charles: *See—*
Knab, James V.; Haeckler, Charles; Bell John; and Fellinger, Jerry, 3,923,482.

Hagenbach, Robert J., to Xerox Corporation. Electrostatic latent image development employing steel carrier particles. 3,923,503, Cl. 96-1.0SD.

Hagey, Lee, to Electro-Voice, Incorporated. Quick mount isolator stand adaptor. 3,924,083, Cl. 179-149.000.

Hagiwara Denki Kabushiki Kaisha: *See—*
Hattori, Shuzo; and Hiramatsu, Tadao, 3,923,380.

Hair, George R. Method of heat sealing sheet-form layers of perforated plastic between layers of paperboard. 3,923,578, Cl. 156-252.000.

Hait, Paul W.: *See—*
Skinner, James R.; Uitz, Mark O.; and Hait, Paul W., 3,923,387.

Hajdu, Laszlo; Hegyessy, Gyorgy; Balla, Jozsef; and Vitan, Gabor, to Medicor Muvek. Electrical detector/transducer/applicable on the skin surface for biometrical observations. 3,923,042, Cl. 128-2.06E.

Hale, Danny B.: *See—*
Riley, Thomas N.; and Hale, Danny B., 3,923,992.

Hallen, Thor Oscar, to Tektronix Inc. Transistor amplifier having single control to simultaneously adjust level input resistance and input voltage. 3,924,198, Cl. 330-32.000.

Halliburton Company: *See—*
Dill, Walter R., 3,923,666.

Hamill, Robert L.; and Stark, William Max, to Eli Lilly and Company. Antibiotic A-2315 and process for preparation thereof. 3,923,980, Cl. 424-118.000.

Hamilton, Ferris F. Submarine tanker for transportation of liquid cargo. 3,922,985, Cl. 114-74.00R.

Hammacher, Konrad, to Hoffmann-La Roche Inc. Process and device for controlling the pressure course of a respirator. 3,923,055, Cl. 128-145.800.

Hammel, Joseph J.; and Allersma, Ties, to PPG Industries, Inc. Thermally stable and crush resistant microporous glass catalyst supports. 3,923,533, Cl. 106-54.000.

Hammel, Joseph J.; and Allersma, Ties, to PPG Industries, Inc. Thermally stable and crush resistant microporous glass catalyst supports and methods of making. 3,923,688, Cl. 252-432.000.

Hammer, Jacob Meyer: *See—*
Duffy, Michael Thomas; Channin, Donald Jones; and Hammer, Jacob Meyer, 3,924,020.

Hampton, Harold E.; and Ellard, Leonard D., to 3 B & D Products, Incorporated. Electromagnetic pick up tool with built-in light. 3,924,115, Cl. 240-6.40R.

Hanake, Tsutomu: *See—*
Sakai, Hiroshi; Takeuchi, Fumio; and Hanake, Tsutomu, 3,923,565.

Hancock, Albert S., Jr.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Huston, Kenneth G.; Rosenberg, Bernard L.; Smith, Shirley M.; and Hausske, Gene W., deceased, 3,923,006.

Hancock, James E., to Clark Equipment Company. Tractor hitch adapter. 3,923,322, Cl. 280-461.00A.

Hancock, John P. Back loaded folded corner horn speaker. 3,923,124, Cl. 181-156.000.

Hanekom, Nicolaas W. Apparatus for controlling temperature. 3,924,102, Cl. 219-497.000.

Hanscom, Genevieve I.: *See—*
Green, Chester, 3,923,143.

Hansen, Franklin A.: *See—*
Solter, Robert L.; and Hansen, Franklin A., 3,922,767.

Hansen, Howard A.; Fulton, Clyde E., deceased; by Fulton, Minnie L., heir; and by McCann, Brenda G., heir, to Crayton, John W.; and Caterpillar Tractor Co. Welding control arrangement with orbital torch-mounted transducing assembly. 3,924,094, Cl. 219-125.0PL.

Hansen, Laurence H.; Massey, Robert E.; and Wojnowski, Aloysius, to Andrew Corporation. Cross-polarized parabolic antenna. 3,924,205, Cl. 333-21.00A.

Hara, Hajime, to Nippon Oil Company Ltd. Method for preparing diethylketone with good selectivity. 3,923,904, Cl. 260-597.00A.

Harada, Hideo; Ichihara, Akinobu; and Ohmori, Yasuro, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Thixotropic polyurethane composition. 3,923,926, Cl. 260-77.5AP.

Harding, William R., to Leco Corporation. Multifaceted mirror structure for infrared radiation detector. 3,923,382, Cl. 350-296.000.

Hardtmann, Goetz E., to Sandoz, Inc. 3-Substituted-oxindoles in compositions and methods of treating obesity. 3,923,996, Cl. 424-274.000.

Hardy, John W., to Itek Corporation. Real-time wavefront correction system. 3,923,400, Cl. 356-107.000.

Hargreaves, Keith: *See—*
George, Harold M.; Hargreaves, Keith; and Wainwright, Paul, 3,923,737.

Harklau, Lanny L., to Minnesota Mining and Manufacturing Company. Circuit for light measuring devices and method. 3,923,403, Cl. 356-201.000.

Harmon, Robert E.; and Mrozik, Helmut H., to Merck & Co., Inc. 4-(Substituted azobenzenesulfonamides as fasciolicides. 3,923,780, Cl. 260-207.000.

Harpold, Michael A.: *See—*
Atkins, Kenneth E.; Harpold, Michael A.; and Smith, Percy L., 3,923,928.

Harrah, Robert S.: *See—*
Gales, Robert S.; and Harrah, Robert S., 3,922,721.

Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., to Minnesota Mining and Manufacturing Company. Perfluoroalkanesulfonamides N-substituted by heterocyclic groups. 3,923,810, Cl. 260-256.50R.

Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., to Minnesota Mining and Manufacturing Company. Perfluoroalkanesulfonamides N-substituted by heterocyclic groups. 3,923,811, Cl. 260-270.00D.

Harrington, Joseph Kenneth; and Trepka, Robert D., to Minnesota Mining and Manufacturing Company. N-(furanylmethyl) fluoroalkanesulfonamides. 3,923,840, Cl. 260-347.200.

Harris, Alfred C., Jr.: *See—*
Davis, Jimmie L.; and Harris, Alfred C., Jr., 3,923,103.

Harris, Edward M.: *See—*
Parker, Edward H.; Harris, Edward M.; and Meador, Jim D., 3,923,761.

Harris, Glyn Islwyn: *See—*
Edwards, Alfred Gerald; and Harris, Glyn Islwyn, 3,923,721.

Harris, John L., to Deltrol Corporation. Automatic control operating mechanism. 3,922,923, Cl. 74-2.000.

Harris, John L., to Deltrol Corporation. Manual preset timer. 3,922,924, Cl. 74-3.500.

Harter Corporation: *See—*
Good, Wayne W., 3,923,280.

Hartmann, Karl: *See—*
Marshall, Robert Swinburn; Hartmann, Karl; and Kraffert, Erich,. 3,924,012.

Harwood, Leopold Albert, to RCA Corporation. Automatic luminance channel bandwidth control apparatus responsive to the amplitude of color image information. 3,924,266, Cl. 358-38.000.

Haschke, Heinz; and Morlock, Gerhard. Process for the production of polycarboxylates having improved biological degradability. 3,923,742, Cl. 260-67.0UA.

Hasegawa, Shoichi: *See—*
Nishiumi, Shiro; Hasegawa, Shoichi; Mizoguchi, Toshiyuki; and Furuta, Sachiko, 3,923,942.

Hashimoto, Masafumi: *See—*
Ono, Takuhiro; and Hashimoto, Masafumi, 3,923,569.

Hassel, Jon M. Kaleidoscope. 3,923,368, Cl. 350-4.000.

Hata, Yukinori; Komiya, Hidetoshi; Osabe, Yuzuru; Watanabe, Tutomu; and Yamada, Hiroyoshi, to Oji Paper Co., Ltd. Photosensitive composition. 3,923,522, Cl. 96-115.00R.

Hattori, Shuzo; and Hiramatsu, Tadao, to Hagiwara Denki Kabushiki Kaisha. Electrooptic modulator utilizing multiple interference. 3,923,380, Cl. 350-160.00R.

Hattori, Toshinori: *See—*
Sawa, Yoichi; Hattori, Toshinori; Katsube, Susumu; and Goto, Akitoshio, 3,923,866.

Hauni-Werke Korber & Co., KG: *See—*
David, Harry, 3,922,837.
Schubert, Bernard, 3,923,173.

Hausler, Rudolf H., to Universal Oil Products Company. Prevention of corrosion. 3,923,606, Cl. 203-7.000.

Hausske, Gene W., deceased: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Huston, Kenneth G.; Rosenberg, Bernard L.; Smith, Shirley M.; and Hausske, Gene W., deceased, 3,923,006.

Hausske, Martha J., executrix: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Huston, Kenneth G.; Rosenberg, Bernard L.; Smith, Shirley M.; and Hausske, Gene W., deceased, 3,923,006.

Haussmann, Albert: *See—*
Hennecke, Rudolf; Kommel, Fritz; and Haussmann, Albert, 3,923,017.

Hautemont, Jean-Claude; and Sartopi, Rolland, to Rhone-Poulenc-Textile. Apparatus for the cutting of a yarn travelling in a tube by means of a fluid. 3,922,938, Cl. 83-100.000.

Hawker Siddeley Dynamics Limited: *See—*
Groves, Henry William; and Yarnell, John, 3,922,911.

Hay, Robert A., II, to Dow Chemical Company, The. Method and apparatus for construction. 3,923,573, Cl. 156-192.000.

Hayakawa, Shigeru: *See—*
Wasa, Kiyotaka; Hosomi, Fumio; and Hayakawa, Shigeru, 3,924,150.

Hayashi, Yutaka; and Tarui, Yasuo, to Kogyo Gijutsuin. Method of manufacturing lateral or field-effect transistors. 3,923,553, Cl. 148-1.500.

Hayes, William H., to Efficiency Tool Company. Cutter employing dual pawl action and automatic stop and return means. 3,922,783, Cl. 30-250.000.

Hazeltine Research, Inc.: *See—*
Bedford, Alan D., 3,924,060.

Hazemeijer B.V.: *See—*
Clason, Jan Christiaan, 3,924,087.

Hazy, Andrew C.; Shirey, John E.; and Ramins, Lothar, to Horizons Incorporated a division of Horizons Research Incorporated. Ultraviolet holdback of nonsilver photosensitive systems by incorporating therein certain organic additives. 3,923,521, Cl. 96-90.00R.

Healy, Robert Michael, to Litton Systems, Inc. Vapor degrea ing system. 3,923,541, Cl. 134-31.000.

Hechenbleikner, Ingenuin; and Enlow, William Palmer, to Borg-Warner Corporation. Preparation of aliphatic phosphates. 3,923,620, Cl. 204-158.00R.

Heenan, Sidney A., to Amerace Corporation. Cube-corner reflector with non-aligned cube axes and element axes. 3,923,378, Cl. 350-103.000.

Hegyessy, Gyorgy: *See—*
Hajdu, Laszlo; Hegyessy, Gyorgy; Balla, Jozsef; and Vitan, Gabor, 3,923,042.

Heifetz, Milton D. Skull tong. 3,923,046, Cl. 128-75.000.

Heijne, Leopold: *See—*
Beekmans, Nicholaas Marinus; and Heijne, Leopold, 3,923,624.

Heinrich Koppers Gesellschaft mit beschrankter Haftung: *See—*
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Heins, Arnold; Blum, Helmut; and Worms, Karl-Heinz, to Bayer Aktiengesellschaft. Complex formers for polyvalent metal ions. 3,923,876, Cl. 260-502.40R.

Heinz, Karl Heinrich. Pendulum support for a multi-point writing instrument. 3,923,404, Cl. 401-33.000.

Heiple, Clinton R.: *See—*
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Heller, Robert I.; Annulis, Francis T.; and Jachimski, Walter, to Westinghouse Electric Corporation. Digital antenna positioning system and method. 3,924,235, Cl. 343-7.400.

Heller, William C., Jr.: *See—*
Leatherman, Alfred F., 3,923,580.

Helling, Juergen. Hybrid drive. 3,923,115, Cl. 180-65.00A.

Hempelmann, Wilhelm, to Gesellschaft fur Kernforschung m.b.H. Method and device for incinerating radioactive wastes and preparing burnable wastes for non-polluting storage. 3,922,974, Cl. 110-8.00R.

Hendrick Manufacturing Company: *See—*
Sparham, Vaughan R.; and Bixby, Leon C., 3,923,649.

Hendrickson, Charles M., to Columbia Steel Casting Co. Upper liner securement for a gyratory crusher. 3,923,258, Cl. 241-207.000.

Hendrickson, Melvin C.: *See—*
Collins, Johnny; and Hendrickson, Melvin C., 3,924,191.

Hengelhaupt, Hans-Georg, to Triumph Werke Nurnberg, A.G. Dual feed rate ribbon mounting and transport assembly. 3,923,141, Cl. 197-151.000.

Henkel & Cie G.m.b.H.: *See—*
Rose, David; and Lepper, Herbert, 3,923,875.

Hennecke, Rudolf; Kommel, Fritz; and Haussmann, Albert, to Delmag-Maschinenfabrik Reinhold Dornfeld. Arrangement for injection nozzle and exhaust openings in a diesel assisted ram. 3,923,017, Cl. 123-32.00R.

Henrick, Clive A., to Zoecon Corporation. Substituted alkylthio butenoic acids and esters. 3,923,868, Cl. 260-481.00R.

Henrick, Clivé A.; and Staal, Gerardus B., to Zoecon Corporation. Cyclopropylmethyl esters. 3,923,871, Cl. 260-485.00L.

Henzler, Albert, to Balzers Patent- & Beteiligungs AG. Vacuum valve construction. 3,923,282, Cl. 251-63.400.

Herbst, Paul T., to Lord Corporation. Universal bearing support. 3,923,349, Cl. 308-26.000.

Hercules Incorporated: *See—*
Dumas, David H., 3,923,745.

Hermann, David Trimble, to American Cyanamid Company. Nonyellowing textile adhesive. 3,923,713, Cl. 260-29.2TN.

Hermann, Heinrich: *See—*
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Hermes, Walter Ludwig; Berkowitz, Murray; and Lombaerde, Charles, to Curtiss-Wright Corporation. Die-cast rotor housing for rotary combustion engines. 3,923,433, Cl. 418-83.000.

Herrera, Jose Pardo. New sliding system applied to foldaway furniture. 3,922,734, Cl. 5-2.00B.

Hersh, David A.; Fye, Robert L.; Whitworth, Kenneth W.; and Willis, William E., to General Motors Corporation. Dipping ladle with level responsive filling operation. 3,923,201, Cl. 222-64.000.

Hertl, William, to Corning Glass Works. Surface modification of silica particles. 3,924,032, Cl. 427-220.000.

Hess, Hans; Mueller, Guenther; and Buehlmann, Xaver, to Ciba-Geigy Corporation. Process for preparing plant enzyme preparations of low germ content. 3,923,599, Cl. 195-66.00R.

Hess, William C.: *See—*
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Heutschi, Hans; and Krebs, Peter, to Sprecher & Schuch AG. Gas-blast power switch for high voltage. 3,924,088, Cl. 200-148.00A.

Heydenreich, Frieder: *See—*
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Heynick, Louis N.; Westerberg, Eugene R.; Bahr, Alfred J.; and Lee, Robert E., to Stanford Research Institute. Charged particle apodized pattern imaging and exposure system. 3,924,136, Cl. 250-492.00A.

Hiatt, Robert Cooper, to Tektronix Inc. Machine for preparing cable. 3,922,934, Cl. 81-9.510.

Hibino, Masaru: *See—*
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Hickey, William P., executor: *See—*
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Hilfiker Pipe Co.: *See—*
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Hilfiker, William K., to Hilfiker Pipe Co. Stringer for retaining wall construction. 3,922,864, Cl. 61-35.000.

Hilfman, Lee, to Universal Oil Products Company. Hydrodesulfurization with a catalyst formed from an alumina sol containing alpha-alumina monohydrate. 3,923,646, Cl. 208-216.000.

Hill, Howard W., to Dow Chemical Company, The. Process for preparing metal salts of dichloroisocyanuric acid. 3,923,802, Cl. 260-248.00C.

Hillegas, Danny H.; Miller, Douglas D.; and Varga, John F., to Weldun Tool & Engineering Co. Apparatus for bending tubing. 3,922,901, Cl. 72-298.000.

Hillegas, William J.: *See—*
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Hilmer, Milton; Ritter, John W.; and Jiandani, Niranjan, to Sarco Company. Steam separator. 3,923,483, Cl. 55-463.000.

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Hinrichs Gesellschaft m.b.H.: *See—*
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Hinson, Virgil: *See—*
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Hirai, Keio: *See—*
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Hirano, Seiichi: *See—*
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Hirano, Tadayo; and Sato, Koichi, to Jintan Terumo Co., Ltd.; and Toppan Printing Co., Ltd. Test tube support. 3,923,160, Cl. 211-73.000.

Hirmann, Georg, to Homberger, Rudolf Felix; and Mayer, Kurt. Valve assembly. 3,923,078, Cl. 137-597.000.

Hirose, Michio; Otani, Mitsunobu; Yamada, Kiyoshi; Mitani, Naoyuki; and Tanaka, Kiyotugu, to Toray Industries, Inc. Apparatus for photo-oxidation of water. 3,924,139, Cl. 250-527.000.

Hisada, Eiichi: *See—*
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Hitachi, Ltd.: *See—*
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Hitachi Medical Corporation: *See—*
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Hittmair, Paul: *See—*
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Ho, Robert S.; Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz Inc. Substituted or unsubstituted p-alkanoyl toluenes as anti-obesity and anti-diabetic agents. 3,924,003, Cl. 424-331.000.

Hoechst Aktiengesellschaft: *See—*
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Hogendyk, Warren. Tubular fabric spreader and feeding apparatus. 3,922,765, Cl. 26-55.00R.

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Itria, Oswald A., to Texaco Inc. Seismic pneumatic energy source with attenuation of bubble pulse amplitude and reduction of period of bubble oscillation. 3,923,122, Cl. 181-115.000.

Iwasa, Shozo: *See—*
Tatara, Seiji; Iwasa, Shozo; and Komura, Shuichi, 3,924,030.

Iwasaki, Kyuhachiro, to Ricoh Co., Ltd. Typewriter carriage decelerator. 3,923,140, Cl. 197-64.000.

Iwashita, Yuji; and Sakuraba, Mitsuru, to Ajinomoto Co., Inc. Process for preparing polyamino acid in a non-polar solvent. 3,923,751, Cl. 260-78.00A.

Izawa, Hisao; and Takemori, Hiroshi, to Sanko Kinzoku Kogyo Kabushiki Kaisha. Water-tight roof verge edge trimming. 3,922,824, Cl. 52-94.000.

Izbicki, Anthony J.: *See—*
Davis, William J.; Izbicki, Anthony J.; and Parsley, Johne, 3,923,936.

Izeki, Manabu: *See—*
Aoki, Hatsuo; Hosoda, Junji; Komori, Tadaaki; Izeki, Manabu; Kubochi, Yoshiaki; Kamiya, Takashi; and Imanaka, Hiroshi, 3,923,977.

J. I. Case Company: *See—*
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J. M. Eltzroth & Associates, Inc.: *See—*
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Jachimski, Walter: *See—*
Heller, Robert I.; Annulis, Francis T.; and Jachimski, Walter, 3,924,235.

Jackson, Julius, to Du Pont de Nemours, E. I., and Company. Primrose chrome yellow pigment and process for its preparation. 3,923,538, Cl. 106-298.000.

Jackson, Lawrence Donald Alexander, to Lawjack Equipment Limited. Automatic discharge regulator. 3,923,210, Cl. 222-494.000.

Jackson, William B.; and Commisso, Nicholas D., to Mobil Oil Corporation. Thermoforming plastic articles. 3,923,948, Cl. 264-161.000.

Jacob, Ezekiel J. Method of raised xerographic printing and product. 3,924,019, Cl. 427-14.000.

Jacobs, James W., to General Motors Corporation. Means for heating incoming water in a dishwasher. 3,923,073, Cl. 134-57.00D.

Jager, Werner, to Industrie Treuhand AG, Firma. Device for conveying objects. 3,923,150, Cl. 198-127.00R.

Jaggers, Brian George; Ufton, Keith Frederick; and Wagner, Horst Richard, to Bush Boake Allen Limited. Oligomeric titanate or zirconate ester perfume compositions. 3,923,700, Cl. 252-522.000.

Jalali (Karchay), Javid. Portable cooling unit. 3,922,878, Cl. 62-384.000.

James Howden Holima B.V.: *See—*
Visch, Tonny Dirk Henricus, 3,923,480.

James, James Roderick, to Plessey Company Limited, The. Dipole antenna with dielectric casing. 3,924,238, Cl. 343-807.000.

James, Michael Joseph, to Micro & Precision Mouldings (Cheltenham) Limited. Fixing arrangements. 3,923,328, Cl. 292-75.000.

James, Robert G. Earth surfacing apparatus. 3,922,802, Cl. 37-97.000.

Jameson, James J., to Gardner-Denver Company. Marine power transmission system. 3,922,997, Cl. 115-37.000.

Jankowiak, Christian S., to Societe Anonyme: Poclain. Device for rigidly assemblying two elements of a jib of a public works machine. 3,923,172, Cl. 214-141.000.

Janssen Pharmaceutica N.V.: *See—*
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willy Joannes, 3,923,808.

Jansson, David Guild. Respiratory protective device. 3,923,053, Cl. 128-142.000.

Jarman, Davis R., to Hinson, Virgil, a part interest. Dent removal device. 3,922,902, Cl. 72-453.000.

Jatcko, Joseph M. Exhaust silencer. 3,923,120, Cl. 181-60.000.

Jennings Compound Bow, Inc.: *See—*
Jennings, Thomas Paul; Williamson, John Monroe; and Sumida Carl, 3,923,036.

Jennings, Thomas Paul; Williamson, John Monroe; and Sumida, Carl, to Jennings Compound Bow, Inc. Bow structure. 3,923,036, Cl. 124-30.00R.

Jensen, Garold K., to United States of America, Navy. Signal analyzer. 3,924,182, Cl. 324-77.00R.

Jensen, Lyle B.; and Thune, Robert E., to FMC Corporation. Mechanism for connecting and disconnecting crane sections. 3,923,407, Cl. 403-165.000.

Jhu, Jai Hun; Wells, George H.; Mulder, Thomas J.; and McDonald, Don E., to Technology Marketing Incorporated. Automatic circuit card testing system. 3,924,109, Cl. 235-153.0AC.

Jiandani, Niranjan: *See—*
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Jintan Terumo Co., Ltd.: *See—*
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Kyogoku, Tuneyoshi, 3,923,207.

Jochum, Peter: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf Dieter, 3,923,740.

Johansen, Carl R., to United States of America, Navy. Acoustic baffle for deep submergence. 3,923,118, Cl. 181-.500.

Johansson, Karl Olof; Nilsson, Alvar Erling; and Skarfelt, Hans TorBjorn, to Munksjo Aktiebolag and Pelly AB. Wire baskets. 3,923,187, Cl. 220-19.000.

Johnson Diversified, Inc.: *See—*
Farnbach, Fred A., 3,923,216.

Johnson, Douglas M., to Fluoroware, Inc. Wafer basket and handle. 3,923,191, Cl. 220-94.00R.

Johnson Electric Coil Co.: *See—*
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Johnson, John H.: *See—*
Fields, Joseph E.; and Johnson, John H., 3,923,972.

Johnson & Johnson: *See—*
Fechillas, Michael R., 3,923,931.

Johnson, LeRoy E.: *See—*
Argoudelis, Alexander D.; Coats, John H.; and Johnson, LeRoy E., 3,923,602.

Johnson, Robert W. Storable cable lock. 3,922,894, Cl. 70-18.000.

Johnston, Thomas Emmett, to Du Pont de Nemours, E. I., and Company. Guanidine carbonate dispersion composition. 3,923,668, Cl. 252-16.000.

Jones, Charles; Lamping, Harold D.; and Myers, David M., to Curtiss-Wright Corporation. Stratified charge rotary engine with high and low pressure fuel supply. 3,923,012, Cl. 123-8.090.

Jones, Charles, to Curtiss-Wright Corporation. Lubricant metering system for the working chambers of a rotary mechanism. 3,923,435, Cl. 418-100.000.

Jones, Howard: *See—*
Shen, Tsung-Ying; and Jones, Howard, 3,923,859.

Jones, Rufus S., to Celanese Corporation. Process for preparing wholly aromatic polyamides in the presence of an aryl sulfone. 3,923,750, Cl. 260-78.00R.

Jordan, Reinhard; and Von Langsdorff, Fritz, to F. von Langsdorff Bauverfahren GmbH. Perforated interlocking slab. 3,923,410, Cl. 404-41.000.

Jorgensen, Hemming Kristian; and Gunnergaard, Marius, to Dansk Industri Syndikat A/S. Apparatus for separating magnetizable castings from casting moulds of sand or similar materials. 3,923,095, Cl. 164-404.000.

Jorns, Peter, to Oxy Metal Industries Corporation. Method concentrate and solution for simultaneous cleaning, degreasing and removal of the lubricant carrier layer from iron and steel workpieces. 3,923,539, Cl. 134-2.000.

Joseph, Walter B.: *See—*
McDonald, Reagan W.; and Joseph, Walter B., 3,922,868.

Jost, Max; and Wick, Arnold, to Ciba-Geigy Corporation. Process for dyeing thermoplastics in the melt. 3,923,727, Cl. 260-40.00P.

Jouffret, Michel: *See—*
Costantini, Michel; Crenne, Noel; Jouffret, Michel; and Nouvel, Jacques, 3,923,895.

Judy, Millard M.: *See—*
Payne, Thomas R.; Plumlee, Hubert R.; and Judy, Millard M., 3,923,581.

Junes, Norman E. Trolley device. 3,922,972, Cl. 105-153.000.

Jurgens, Rainer: *See—*
Cruickshank, James R.; and Jurgens, Rainer, 3,923,324.

K-2 Corporation: *See—*
Miller, Forrest A.; Wirsching, Michael T.; and Hosick, Frank A., 3,922,800.

Kaalverink, Gerardus Hendrikus, to Ruti-Te Strake B.V. Yarn pulling device. 3,923,262, Cl. 242-47.010.

Kabas, Guglielmo; Schlaepfer, Hans; and Fletcher, Ian John, to Ciba-Geigy AG. 2-Stilbenyl-4-styryl-v-triazoles, their use for the optical brightening of organic materials, and processes for their manufacture. 3,923,677, Cl. 252-89.000.

Kabs, Klaus: *See—*
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Kabushi Kaisha Toyota Chuo Kenkyusho: *See—*
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,923,698.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
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Kobayashi, Masanori, 3,922,843.
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
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Watanabe, Etsuji; Miyazaki, Tsutomu; Kato, Takashi; and Miyamoto, Noriaki, 3,922,840.

Kabushiki Kaisha Toyota Jidoshokki Seisakusho: *See—*
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Kadotani, Kenzo; Honda, Tatuo; and Isogai, Tokio, to Hitachi, Ltd. Method for forming epoxy resin products. 3,923,725, Cl. 260-37.0EP.

Kaftan, John A. Magnetic window cleaning apparatus with improved cleaning material. 3,922,747, Cl. 15-220.00A.

Kagoura, Tetsuro, to Yoshida Kogyo K.K. Door locking device. 3,922,896, Cl. 70-223.000.

Kaiser, Rudolf; Karcher, Werner; and Bringe, Wolfgang, to Siemens Aktiengesellschaft. System of structural components for the construction of shelflike structures in frame racks. 3,923,161, Cl. 211-117.000.

Kalamazoo Spice Extraction Company: *See—*
Worden, Leonard R., 3,923,897.

Kalb, Hans, to AEG-Kanis Turbinenfabrik GmbH. Speed control device. 3,922,853, Cl. 60-325.000.

Kalnin, Robert Karlovich: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorofeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich; Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, 3,924,211.

Kamata, Sachio: *See—*
Furuse, Takashi; Kamata, Sachio; Sekine, Kunio; and Sato, Koichi, 3,923,094.

Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, to Nippondenso Co., Ltd.; and Kabushi Kaisha Toyota Chuo Kenkyusho. Resistors for ignition plugs. 3,923,698, Cl. 252-518.000.

Kamiya, Takashi: *See—*
Aoki, Hatsuo; Hosoda, Junji; Komori, Tadaaki; Izeki, Manabu; Kubochi, Yoshiaki; Kamiya, Takashi; and Imanaka, Hiroshi, 3,923,977.
Imanaka, Hiroshi; Kamiya, Takashi; Maeno, Shizuo; Miyoshi, Toshio; Miyairi, Norimasa; Aoki, Hatsuo; Kohsaka, Masanobu; Komori, Tadaaki; and Sakai, Heiichi, 3,923,790.

Kanazawa, Kazuo: *See—*
Takei, Kiyomi; Takahashi, Katsumi; and Kanazawa, Kazuo, 3,922,925.

Kane, Neil G., deceased; and by Kane, Virginia L., administrator. Method of forming a such-back-preventing check valve in a liquid dispenser. 3,923,949, Cl. 264-163.000.

Kane, Virginia L., administrator: *See—*
Kane, Neil G., deceased; and Kane, Virginia L., administrator, 3,923,949.

Kane, William Paul, to Du Pont de Nemours, E. I., and Company. Method of cooking food in a polythylene terephthalate/paperboard laminated container. 3,924,013, Cl. 426-523.000.

Kane, William S.; and Cardwell, Paul H., to Deepsea Ventures, Inc. Winning of metal values from ore utilizing recycled acid leaching agent. 3,923,615, Cl. 204-105.00M.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Namito, Yoshio; Kobayashi, Masahiro; and Kojima, Takeshi, 3,923,826.

Kangol Magnet Limited: *See—*
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Kanjo, Wajih: *See—*
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Kansai Paint Company, Ltd.: *See—*
Maruyama, Tsutomu; and Yamashita, Kazuo, 3,924,021.
Usami, Shoji; and Kozu, Haruo, 3,923,540.

Kansas State University Research Foundation: *See—*
Lambert, Jack L.; and Fina, Louis R., 3,923,665.

Kansy, Robert, to University of Illinois Foundation. Surface wave device having a ferroelectric substrate with a sinusoidal pole region. 3,924,145, Cl. 310-9.500.

Kanzaki Paper Manufacturing Company Ltd.: *See—*
Saito, Toranosuke; Kohno, Jujiro; Tanaka, Daiichiro; and Oda, Shinichi, 3,924,027.

Kao, Chang-Fu. Push type writing implement. 3,923,405, Cl. 401-82.000.

Kao Soap Co. Ltd.: *See—*
Furukawa, Jun-ichi; and Kono, Yoshinao, 3,923,708.

Karcher, Werner: *See—*
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Kardashian, Vahram S., to Honeywell Inc. Displacement detector using magnetometer sensor. 3,924,261, Cl. 340-17.000.

Karklys, Joseph, to Whirlpool Corporation. Digital logic control for automatic washer. 3,922,889, Cl. 68-12.00R.

Karsunky, Ulrich: *See—*
Ong, Sienling; Grossmann, Max; and Karsunky, Ulrich, 3,923,457.

Kasahara, Yoshikazu: *See—*
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Kashio, Toshio, to Casio Computer Co., Ltd. Information recording apparatus. 3,923,137, Cl. 197-19.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Electronic calculator. 3,924,112, Cl. 235-156.000.

Kast, Howard Berdolt, to General Electric Company. Fail-fixed servovalve. 3,922,955, Cl. 91-461.000.

Katayama, Hajime: *See—*
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Kato, Hisao. Bed for patient. 3,922,735, Cl. 5-91.000.

Kato, Masao: *See—*
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Kato, Takashi: *See—*
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Kato, Yasuhiro. Apparatus for storage and discharge of flowable solid materials. 3,923,204, Cl. 222-228.000.

Kato, Yoshiaki: *See—*
Miyasaka, Kenzi; Takemoto, Mikio; Kato, Yoshiaki; Uematu, Hiroyuki; Tamaru, Munetaka; Kume, Kazunari; Ohno, Hideshi; and Onda, Mitsuo, 3,922,845.

Katonak, David Allen: *See—*
Coffen, David Llewellyn; and Katonak, David Allen, 3,923,814.

Katsube, Susumu: *See—*
Sawa, Yoichi; Hattori, Toshinori; Katsube, Susumu; and Goto, Akitoshio, 3,923,866.

Katsumata, Tomoaki; and Matsushima, Norihisa, to Sumitomo Electric Industries, Ltd. Steel cord. 3,922,841, Cl. 57-145.000.

Katsuyama, Harumi: *See—*
Ono, Hisatake; Katsuyama, Harumi; and Watarai, Shu, 3,923,824.

Katto, Takayuki: *See—*
Murayama, Naohiro; Katto, Takayuki; and Ichii, Takao, 3,923,621.

Katz, Murray; Smith, Stanley W.; and Reitsma, David, to United Technologies Corporation. Corrosion protection for a fuel cell coolant system. 3,923,546, Cl. 136-86.00R.

Kawai, Mitsuo: *See—*
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Kawakami, Hirotake: *See—*
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Kayaku Antibiotic Research Co., Ltd.: *See—*
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Kaziz, Claude: *See—*
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Keck, Werner: *See—*
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Keefe, Donald J., to United States of America, Energy Research and Development Administration. Background compensation for a radiation level monitor. 3,924,106, Cl. 235-92.0PC.

Kehren, Engelbert Wolfgang: *See—*
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Kell, John, to Kangol Magnet Limited. Inertia reels for vehicle safety belts. 3,923,269, Cl. 242-107.400.

Keller, Harold A.: *See—*
Glover, Clinton G.; and Keller, Harold A., 3,923,219.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Method for crucible-free zone melting of semiconductor crystal rods. 3,923,468, Cl. 23-301.0SP.

Kelley Company, Inc.: *See—*
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Kellum, Gene E.; and Gilbert, Ronald E., to Gulf Research & Development Company. Ethylene polymerization process in the presence of quinone alkides. 3,923,767, Cl. 260-94.90R.

Kelly, Ellsworth A. Fishing gear retriever. 3,922,810, Cl. 43-17.200.

Kemble, James Edward: *See—*
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Kemlite Corporation: *See—*
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Kemmenoe, Adrian Victor: *See—*
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Kemper, James M., to Monogram Industries, Inc. Recirculating toilet system for use in aircraft or the like. 3,922,730, Cl. 4-10.000.

Kendall Company, The: *See—*
Samour, Carlos M., 3,923,995.
Schaar, Charles H., 3,923,048.
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Kennametal Inc.: *See—*
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Kennedy, Joseph P.; and Chou, Tom M., to University of Akron, The. Process for the preparation of isobutylene/beta-pinene copolymers. 3,923,759, Cl. 260-88.200.

Keowski, John W.: *See—*
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Keranen, Theodore W., to Bendix Corporation, The. System for reordering the fuel injection sequence to facilitate starting of an internal combustion engine. 3,923,031, Cl. 123-179.00L.

Kern, Jean-Paul; Lemarechal, Jacques; and Desforges, Malcolm, to Unisabi S.A. Process of texturizing meat material. 3,924,011, Cl. 426-518.000.

Kernbichler, Rolf: *See—*
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Kershaw, Samuel L.; and Proeschl, Bernard E., to Caterpillar Tractor Co. Modular truck body and method for making the same. 3,923,337, Cl. 296-28.00M.

Kester, Wilhelmus Leonardus Maria, to Van Doorne's Personenautofabriek Daf B.V. Steering column for a motorvehicle. 3,922,928, Cl. 74-492.000.

Key, Hugh L. Vehicle bed cover assembly. 3,923,334, Cl. 296-10.000.

Keystone International, Inc.: *See—*
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Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,923,770.
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,923,771.

Kidde, Gustave E. Process for the production of calcium fluoride from fluosilicates and by-product gypsum. 3,923,964, Cl. 423-490.000.

Kidde Merchandising Equipment Group: *See—*
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Kierstead, Richard W.; and LeMahieu, Ronald A., to Hoffmann-La Roche Inc. Erythromycin a derivatives. 3,923,784, Cl. 260-210.00E.

Kiff, Ben Wilton, to Union Carbide Corporation. Production of acetic acid. 3,923,882, Cl. 260-533.00R.

Kikuchi, Yoshikazu: *See—*
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Kimata, Isao, to Yazaki Corporation. Power transmission assembly for use in motor vehicles. 3,922,882, Cl. 64-2.00R.

Kimber, Erich Voldemar, to Atlas Copco AB. Longitudinally adjustable drill boom. 3,923,276, Cl. 248-16.000.

Kimura, Rikiti: *See—*
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King, Jimmie D.; and Powell, Harry R. Enclosed concrete water reservoir supporting earthfill for multiple land uses. 3,922,823, Cl. 52-80.000.
King, Leonard Tony, to Komax Systems, Inc. Material mixing apparatus. 3,923,288, Cl. 259-4.000.
Kinkel, Heinz-Joachim: *See—*
Baukal, Werner; Kinkel, Heinz-Joachim; Robens, Erich; and Walter, Gerhard, 3,923,969.
Kinney, Gary W. Device for spoking and aligning wire wheels. 3,923,090, Cl. 157-1.500.
Kins Development Limited: *See—*
Marchant, Ian McGregor, 3,923,245.
Kippen, Albert J., to Bangor Punta Operations, Inc. Holster. 3,923,214, Cl. 224-2.00B.
Kirchner, Jack R.; and Vaughan, Lawrence G., to Du Pont de Nemours, E. I., and Company. Production of hydrogen peroxide using the anthraquinone process. 3,923,967, Cl. 423-588.000.
Kishida, Masahiko: *See—*
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Kishigami, Jun: *See—*
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Kishikawa, Kanichi; and Nakajima, Koe, to Nippon Steel Corporation. Method of and apparatus for rolling unsymmetrical shape element having the flange. 3,922,900, Cl. 72-225.000.
Kitahara, Hisao: *See—*
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Kitano, Ichiro; Koizumi, Ken; and Matsumura, Hiroyoshi, to Nihon Itagarasu Kabushiki Kaisha. Method of producing light-conducting glass structure. 3,923,486, Cl. 65-30.00E.
Kitazawa, Kunio; and Fukusako, Tatsuichi, to Toyo Valve Co., Ltd. Copper base alloy. 3,923,500, Cl. 75-156.500.
Klebold, Franklin R.; and Bruce, Robert L. Anti-intrusion alarm system. 3,924,254, Cl. 340-261.000.
Kleiman, Charles: *See—*
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Klein, Alfons: *See—*
Imre, Laszlo; Klein, Alfons; and Wedemeyer, Karlfried, 3,923,903.
Klein, Dieter Heinrich, to Dow Chemical Company, The. Process for enhancing the dispersion stability of nonaqueous dispersions. 3,923,723, Cl. 260-33.6UA.
Kleiner, Hans-Jerg; Koller, Otto; Schneider, Karl-Heinz; and Schneider, Gerhart, to Hoechst Aktiengesellschaft. Liquid cleansing agent concentrates. 3,923,678, Cl. 252-89.000.
Klemm, Kurt; and Langenscheid, Erhard, to Byk Gulden Lomberg Chemische Fabrik Gesellschaft. 2-Hydrazonomethyl-3-hydroxy-4-aza-2,4-pentadienenitriles. 3,923,817, Cl. 260-293.870.
Klimek, Boleslaw; and Ma, James W., to Berg Manufacturing Company, The. Dual circuit brake valve. 3,923,346, Cl. 303-52.000.
Kline, Charles M.; Priepke, Edward H.; Waldrop, Thomas W.; Fisher, Raymond E.; Greiner, James G.; and McCarty, Horace G., to Sperry Rand Corporation. Machine for forming a compact stack of crop material. 3,922,838, Cl. 56-344.000.
Klinke, Peter: *See—*
Ribka, Joachim; Piesch, Steffen; Engelhardt, Friedrich; Pfeiffer, Gerhard; Klinke, Peter; and Schidlo, Wolfram, 3,924,046.
Klopfer, Osakar E. H., to Ethyl Corporation. Aromatic amine alkylation. 3,923,892, Cl. 260-578.000.
Knab, James V.; Haeckler, Charles; Bell, John; and Fellinger, Jerry, to Knab, James V. Clean air directing apparatus. 3,923,482, Cl. 55-412.000.
Knapp, Burton Bower: *See—*
Chart, John Edward; and Knapp, Burton Bower, 3,923,696.
Knepp, James E., to Aluminum Company of America. Metal working lubricant. 3,923,671, Cl. 252-49.500.
Knickerbocker, Karl. Internal combustion rotary engine. 3,923,014, Cl. 123-8.490.
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Knowles, Alvis R.; and Foster, Harold S., to Eldon Industries, Inc. Stand for charging an electric tool and the combination of this stand with such a tool. 3,924,097, Cl. 219-242.000.
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Kobayashi, Masanori, to Kabushiki Kaisha Suwa Seikosha. Cyclometer clock. 3,922,843, Cl. 58-16.00D.
Kobayashi, Seihin; and Torii, Michihiro, to Fuji Electrochemical Co., Ltd. Non destructive read out magnetic core memory apparatus having linear hysteresis loop noise cancelling core. 3,924,248, Cl. 340-174.0DC.
Kobayashi, Toshihiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method and apparatus for burning raw materials of cement clinker. 3,923,536, Cl. 106-100.000.
Kobe Steel Ltd.: *See—*
Inoue, Kimio; Hirano, Seiichi; Sakai, Tamiharu; and Ikuno, Yasokazu, 3,923,450.
Kober, Ehrenfried H.; Rozsa, George; and Schnabel, Wilhelm J., to Olin Corporation. Preparation of a mixture of polyisocyanates by phosgenating a slurry of a mixture of polyamines. 3,923,732, Cl. 260-453.0PH.
Kober, Ehrenfried H.; and Schnabel, Wilhelm J., to Olin Corporation. Preparation of aromatic isocyanates. 3,923,850, Cl. 260-453.0PC.
Kobetz, Paul; and Lindsay, Kenneth L., to Ethyl Corporation. Chemical process. 3,923,914, Cl. 260-658.00R.
Koehler-Dayton, Inc.: *See—*
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Kohfeldt, Walter C., to Exxon Research & Engineering Co. Naphtha steam-cracking quench process. 3,923,921, Cl. 260-683.00R.
Kohjin Co., Ltd.: *See—*
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Kolb, James M.; and O'Leary, Kevin J., to Electronor Corporation. Method of making an electrode having a coating of cobalt metatitanate thereon. 3,924,025, Cl. 427-126.000.
Koller, Horst: *See—*
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Koller, Otto: *See—*
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Kolycheck, Edmond G., to B. F. Goodrich Company, The. Poly(caprolactone)based polyurethanes having improved blocking characteristics. 3,923,747, Cl. 260-77.5AN.
Komatsu, Akira; Yoshida, Toshio; Akutagawa, Susumu; Norose, Fumitaka; Yamamoto, Takeshi; and Kumasa, Ikuji, to Takasago Perfumery Co., Ltd. Cyclohexadecenone-5 perfume compositions. 3,923,699, Cl. 252-522.000.
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Kota..igawa, Takeshi; Yamamoto, Mitsuyoshi; and Shimokawa, Katsuyoshi, to Director-General, Agency of Industrial Science and Technology. Process for the preparation of methylated phenols. 3,923,907, Cl. 260-621.00R.

Kottmeier, Merrill F. Magnetic apparatus for treating liquids containing calcareous matter. 3,923,660, Cl. 210-222.000.

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Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. 2H-pyrazolo[4,3-c]pyridines. 3,923,816, Cl. 260-293.550.

Krasnov, Mikhail Mikhailovich. Artificial crystalline lens. 3,922,728, Cl. 3-13.000.

Krebs, J. Robert; and Abele, Thomas G., to Multi-Flo, Inc. Package aerobic waste treatment system. 3,923,656, Cl. 210-86.000.

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Krehan, Friedrich Wilhelm, to Messerschmitt-Bolkow-Blohm G.m.b.H. Detonating system. 3,922,948, Cl. 89-1.50F.

Krejci, Joseph C., to Phillips Petroleum Company. Apparatus for producing carbon black. 3,923,465, Cl. 23-259.500.

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Kriz, Karel; Gorman, Susan B.; and Krajewski, John J., to DeSoto, Inc. Dyed polyvinyl carbazole photoconductive layer. 3,923,508, Cl. 96-1.600.

Kroll, Raymond A.; and Sullivan, Donald K., to Outboard Marine Corporation. Dual station rotary cable steering system. 3,922,995, Cl. 115-18.00R.

Kronies, Reinhard Kurt, to Burroughs Corporation. Memory cycle initiation in response to the presence of the memory address. 3,924,241, Cl. 340-172.500.

Krueger, Klifford C.; and Krueger, Lucile M. Paper towel holder. 3,923,265, Cl. 242-55.200.

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Krug, Gloria A. Volleyball score display device. 3,922,805, Cl. 40-102.000.

Kruger, James Brompton, to Scovill Manufacturing Company. Plier-type snap fastener applier. 3,923,229, Cl. 227-144.000.

Kruppenbach, John A.; and Bedenbender, John W., to Texas Instruments Incorporated. Towed land cable. 3,923,121, Cl. 181-112.000.

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Kuehn, Erich; and Wyhof, John R., to ICI United States Inc. Water-soluble polyester resins as binders for photoconductors. 3,923,509, Cl. 96-1.800.

Kufrin, Frederick W.: *See*—
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Kumada, Akio, to Hitachi, Ltd. Light control element having a wide viewing angle. 3,923,379, Cl. 350-150.000.

Kumasa, Ikuji: *See*—
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Kume, Makoto, to Nippon Sheet Glass Co., Ltd. Glass-ceramic articles. 3,923,528, Cl. 106-52.000.

Kunz, Hans J.: *See*—
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Kupper, Willi, to W. Schlafhorst & Co. Maschinenfabrik. Device for making-ready the unwinding operation of cops. 3,923,264, Cl. 242-35.60E.

Kuraray Co., Ltd.: *See*—
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Kureha Kagaku Kogyo K.K.: *See*—
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Kurka, Kurt A., to Minnesota Mining and Manufacturing Company. Linear β-hydroxy-ester, β-hydroxy-ether and β-hydroxy-amine polymers. 3,923,739, Cl. 260-47.0EP.

Kurosaki, Minoru; Nakamura, Tsutomu; Matuki, Akira; Mogami, Okikazu; Tsugu, Yoshitomo; and Morikawa, Masatoshi, to Nippon Columbia Kabushiki Kaisha. Stepping musical machine. 3,922,944, Cl. 84-1.010.

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Kurtzberg, Jerome Marvin, to International Business Machines Corporation. Recursive shift register for controlling a data processor. 3,924,270, Cl. 340-172.500.

Kurz, Dieter: *See*—
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Kyogoku, Tuneyoshi, to Jintan Terumo Co., Ltd. Microliter syringe for dispensing small, accurately measured quantities of fluid specimens. 3,923,207, Cl. 222-386.000.

L. M. & L Corporation: *See*—
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Lab nee Astier, Claudine: *See*—
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Labofina S.A.: *See*—
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Laboratorios Made, S.A.: *See*—
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La Branche, Harvey W.; and Dimmer, John C., to Western Plastics Corporation. Method for shaping a normally rigid plastic pipe. 3,923,952, Cl. 264-313.000.

Lachman, Irwin M., to Corning Glass Works. High temperature NiO rubbing seal material containing CuO and CaF_2. 3,923,667, Cl. 252-12.000.

Lacoste, Jean Rene, to Patentex S.A. Racket and string holding elements. 3,923,303, Cl. 273-73.00D.

Lacy, Robert H.; and Russell, James E., to F&M Systems Co. Display device having an array of movable display elements. 3,924,226, Cl. 340-336.000.

Lada, George J., to Allied Chemical Corporation. Automatic liquid feed interlock with workload. 3,923,071, Cl. 134-47.000.

Ladouceur, Harold A., to Multifastener Corporation. Method of forming a panel assembly. 3,922,770, Cl. 29-445.000.

Ladouceur, Harold A., to Multifastener Corporation. Nut and panel assembly. 3,923,089, Cl. 151-41.730.

La Follette, Robert L., to American Challenger Corporation. Shift ring for a marine clutch. 3,923,131, Cl. 192-21.000.

Lafont, Jean-Claude: *See—*
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Lake, Graham Albert John: *See—*
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Lake, Ralph Jones, Jr., to RCA Corporation. Satellite propellant management system. 3,923,188, Cl. 220-20.000.

Lakshmanan, Pallavoor R., to Gulf Research & Development Company. Adhesive composition. 3,923,722, Cl. 260-32.80A.

Lalet, Philippe: *See—*
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Lalk, Robert H.; and Evani, Syamalarao, to Dow Chemical Company, The. A kiln feed slurry for making portland cement containing an inorganic slat of a styrene-maleic anhydride copolymer. 3,923,717, Cl. 260-29.60S.

Lamand, Michel; Lab nee Astier, Claudine; Roux, Remy; and Chagnaud, Paul, to Establissement Public Dit: Institut National de la Recherche Agronomique. Process for preventing trace element deficiency in animals and compositions for carrying out said process. 3,923,982, Cl. 424-140.000.

Lambert, Jack L.; and Fina, Louis R., to Kansas State University Research Foundation. Demand bactericide for disinfecting water and process of preparation. 3,923,665, Cl. 210-501.000.

Lamping, Harold D.: *See—*
Jones, Charles; Lamping, Harold D.; and Myers, David M., 3,923,012.

Lancaster, Peter John, to E. B. Burdon (Engineers) Limited. Vehicle washing plant. 3,923,658, Cl. 210-108.000.

Lander, Lars: *See—*
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Lands, Jack F., Jr., to Schlumberger Technology Corporation. Well bore perforating apparatus. 3,923,105, Cl. 175-4.550.

Landvatter, Henry W. Hitch for portable conveyor. 3,923,175, Cl. 214-509.000.

Langbein, Adolf: *See—*
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Langen & Co.: *See—*
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Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Intermittent load accumulator. 3,923,144, Cl. 198-31.0AB.

Langenscheid, Erhard: *See—*
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Langley, Robert Leonard: *See—*
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Langnickel, Wolfgang, to Olympia Werke AG. Character display dot raster signal generator provided with character memory. 3,924,225, Cl. 340-324.0AD.

Lantz, Robert, to United States of America, Army. Double base propellant with thorium containing ballistic modifier. 3,923,564, Cl. 149-19.800.

Laporte, Jean-Claude: *See—*
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Laporte, Jean-Michel; and Laporte, Jean-Claude. Electrically controlled target throwing device. 3,923,033, Cl. 124-8.000.

Laptewicz, Joseph E., Jr.: *See—*
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Larin, Vladimir Borisovich: *See—*
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Larsson, Karl Olof Axel Helmer; and Lander, Lars. Holder with tear-off mechanism for web-like material. 3,923,223, Cl. 225-46.000.

Lashley, Everett R., Jr., to Union Carbide Corporation. Detoxification of aldehydes and ketones. 3,923,648, Cl. 210-12.000.

Lathey, Howard N.: *See—*
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Latimer-Sayer, Laurence. Sound reproducing apparatus. 3,923,123, Cl. 181-144.000.

LaTour, Harry, to Armco Steel Corporation. Universal continuous casting apparatus. 3,923,093, Cl. 164-282.000.

Lauber, Leo E.; and Cowden, Ernest A. Orthopedic cast and method of constructing same. 3,923,049, Cl. 128-91.00R.

Lauck, John A. Emergency control valve. 3,923,423, Cl. 417-3.000.

Laurent, Jacques: *See—*
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Lavaux, Jean-Paul: *See—*
Derible, Pierre Henri; Lavaux, Jean-Paul; and Laurent, Jacques, 3,923,800.

Lavin, Joseph L. Method and apparatus for forming and fitting orthodontic appliances. 3,922,786, Cl. 32-11.000.

Lavins, Paul N., Jr., to American Induction Heating Corporation. Method for cleaning metallic filters of plastic waste. 3,923,653, Cl. 210-71.000.

Lavo, Harry F.; and Cante, Charles J., to General Foods Corporation. Plant husbandry. 3,922,977, Cl. 111-1.000.

Law, Harold Bell, to RCA Corporation. Method of fabricating an apertured mask for a cathode-ray tube. 3,923,566, Cl. 156-3.000.

Lawjack Equipment Limited: *See—*
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Lawler, Harry A.; and Reys, John, to Carborundum Company, The. Non-rigid seal for joining silicon carbide tubes and tube sheets in heat exchangers. 3,923,314, Cl. 277-112.000.

Lawrence, John E., to Silicon Materials, Inc. Method of reclaiming a semiconductor wafer. 3,923,567, Cl. 156-7.000.

Lawrence Peska Associates, Inc.: *See—*
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Lay, Kenneth W., to General Electric Company. Process for preparing sintered uranium dioxide grains. 3,923,933, Cl. 264-.500.

Lazar, Remus I.; and Reichel, Richard C., to Velsicol Chemical Corporation. New dye compositions. 3,923,453, Cl. 8-39.000.

Lear, Edward C.: *See—*
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Leatherman, Alfred F., to Heller, William C., Jr. Fabricating method and article formed thereby. 3,923,580, Cl. 156-272.000.

Leblanc, Conrad L., to Foster Grant Co., Inc. Self adjusting spectacle frame assembly. 3,923,384, Cl. 351-113.000.

Leclabart, Jacques, to Perma. Heating sleeve for a hair curler. 3,923,069, Cl. 132-36.0CC.

Leco Corporation: *See—*
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Lee, Bong Gill. Cigarette case. 3,923,239, Cl. 229-51.00C.

Lee, Chi-Hang; Scarpellino, Richard John; and Murtagh, Marjorie Mary, to General Foods Corporation. Sweetness inducer. 3,924,017, Cl. 426-548.000.

Lee, Robert E.: *See—*
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Lee Wilson Engineering Company, Inc.: *See—*
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Leeds & Northrup Company: *See—*
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Leff, Martin; and Olesen, Paul, to Swingline, Inc. Multiple shot fastening gun. 3,923,228, Cl. 227-132.000.

Lefort, Pierre: *See—*
Llop, Helenio; and Lefort, Pierre, 3,923,401.

Legutke, Gunter: *See—*
Ohorodnik, Alexander; Gehrmann, Klaus; Legutke, Gunter; and Vierling, Hermann, 3,923,917.

Lehman, Gerhard H., to Elgin Sweeping Services, Inc. Broom device. 3,922,745, Cl. 15-87.000.

Leigh, Roland Albert. Compositions containing dithionites. 3,923,960, Cl. 423-265.000.

Leimgruber, Jean-Daniel: *See—*
Gerber, Jean-Pierre; and Leimgruber, Jean-Daniel, 3,922,846.

Leitner, Kajetan. Spring clamp fixable in a circular hole in a plate or panel. 3,923,295, Cl. 267-158.000.

LeMahieu, Ronald A.: *See—*
Kierstead, Richard W.; and LeMahieu, Ronald A., 3,923,784.

Lemarechal, Jacques: *See—*
Kern, Jean-Paul; Lemarechal, Jacques; and Desforges, Malcolm, 3,924,011.

LeMay, Christopher Archibald Gordon, to E M I Limited. Method and apparatus for constructing a representation of a planar's slice of body exposed to penetrating radiation. 3,924,129, Cl. 250-336.000.

Lemineur, Joseph; and Arys, Rene, to Ampex Corporation. Tape loop tension arm position indicator system. 3,924,177, Cl. 324-61.00R.

Leonard, Byron H., Jr. Fuel assemblies for nuclear reactors. 3,923,596, Cl. 176-75.000.

Leonard, Keith W. G. Vertical spindle pulverisers. 3,923,255, Cl. 241-56.000.

Leonard, Louis H., to Carrier Corporation. High temperature heat recovery in refrigeration. 3,922,873, Cl. 62-84.000.

Leonardo, Ignazio; and Coll, Eugene, to General Cable Corporation. Drop in anchor stud. 3,922,947, Cl. 85-77.000.

Leopold, Eric Jan, to Eli Lilly and Company. Insecticidal substituted alkenes. 3,923,832, Cl. 260-340.500.

Le Page, Jean-Francois: *See—*
Franck, Jean-Pierre; Torck, Bernard; and Le Page, Jean-Francois, 3,923,915.

Lepper, Herbert: *See—*
Rose, David; and Lepper, Herbert, 3,923,875.

Leskovar, Peter: *See—*
Weitze, Artur; and Leskovar, Peter, 3,922,777.

Lessmann, Gerald G.; and Vaia, Albert R., to Westinghouse Electric Corporation. Method and apparatus for cladding a base metal. 3,924,092, Cl. 219-76.000.

Lester Laboratories, Inc.: *See—*
Peters, John P.; and McAmish, Larry H., 3,924,157.

Leupold, Karl Heinz. Device for acupuncture. 3,923,064, Cl. 128-329.00A.

Lever Brothers Company: *See—*
Marshall, Robert Swinburn; Hartmann, Karl; and Kraffert, Erich, 3,924,012.
Ney, Karl Heinz; Wirotama, I. Poetoe Gde; and Freytag, Wolfram Gustav, 3,924,014.

Levering, Kenneth A.: *See—*
Allread, Alan R.; and Levering, Kenneth A., 3,923,080.

Levi, Lev Izrailevich: *See—*
Portnoi, Kim Isaevich; Arabei, Lidia Borisovna; Gryazno, Georgy Mikhailovich; Levi, Lev Izrailevich; Lunin, Gleb Leonidovich; Kozhukhov, Valery Mikhailovich; Markov, Jury Mikhailovich; and Fedotov, Mikhail Egorovich, 3,923,502.

Lewis, Albert D., to Owens-Illinois, Inc. Method of making glass ampuls in a non-contaminating manner. 3,923,487, Cl. 65-110.000.

Lewis, Bob, to Sullivan, T. M.; and Manners, Joseph A., Sr. Automatic basting device. 3,922,960, Cl. 99-346.000.

Lewis, David W. Apparatus for forming integral homogeneous buildings. 3,923,436, Cl. 425-64.000.

Lewis, Robert W.; Rodgers, Thomas A.; and Goeking, Charles F., Jr., to Shell Oil Company. Removal of lead and other suspended solids from used hydrocarbon lubricating oil. 3,923,643, Cl. 208-179.000.

Lewis Woolf Griptight Limited: *See—*
Hurst, Eric Kenneth, 3,923,067.

Libit, Sidney M. Child-resistant closures. 3,923,181, Cl. 215-224.000.

Lieberman, Sheldon I.: *See—*
Auborn, James J.; and Lieberman, Sheldon I., 3,923,543.

Lifetime Metal Products, Inc.: *See—*
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Liggett & Myers Incorporated: *See—*
Van Hall, Floyd, 3,923,146.

Lincoln First Bank of Rochester, executor: *See—*
Eichorn, Roger H., deceased; and Lincoln First Bank of Rochester, executor, 3,923,004.

Lind, Earl V., to Schlegel Manufacturing Company, The. Weatherseal manufacture. 3,923,576, Cl. 156-244.000.

Lind, Michael A., to New Draulics, Inc. Open system fluid driven pruner. 3,922,782, Cl. 30-228.000.

Lindberg, Russell A., to United States of America, General Counsel-Code GP. High temperature beryllium oxide capacitor. 3,924,164, Cl. 317-258.000.

Lindblom, Robert O.: *See—*
Camp, Carolyn J.; and Lindblom, Robert O., 3,924,050.

Lindfors, Olov Halvar, to AB Volvo. Arrangement for power transmission from a stationary electric conductor to a vehicle. 3,924,084, Cl. 191-45.000.

Lindmayer, Joseph; and Allison, James Frederick, to Communications Satellite Corporation. Tantalum pentoxide anti-reflective coating. 3,922,774, Cl. 29-572.000.

Lindsay, Kenneth L.: *See—*
Kobetz, Paul; and Lindsay, Kenneth L., 3,923,914.

Link, Helmut, to Index-Werke KG Kahn & Tessky. Driving a single spindle lathe. 3,922,936, Cl. 82-28.000.

Linsinger, Ernst. Apparatus for trimming and edge-cutting a plate-like metallic workpiece. 3,922,951, Cl. 90-15.00R.

Linz, Albert. Drive means for vehicle mounted vibratory compactor. 3,923,412, Cl. 404-133.000.

Lippitsch, Josef: *See—*
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Little Giant Products, Inc.: *See—*
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Litton Systems, Inc.: *See—*
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Ngo, Charles C. M., 3,924,250.

Liu, Chung C., to International Business Machines Corporation. Bipolar digital to analog converter utilizing two reference voltages of the same polarity. 3,924,229, Cl. 340-347.0DA.

Livingstone, John Lewis: *See—*
Andrews, Roderic Stafford; Barlow, Christoper George; and Livingstone, John Lewis, 3,923,974.

Llop, Helenio; and Lefort, Pierre, to Societe d'Optique, Precision Electronique et Mechanique — Sopelem. Solution concentration responsive apparatus. 3,923,401, Cl. 356-135.000.

LoCicero, James T. Slotted masonry wall structure and metal stud therefor. 3,924,056, Cl. 174-48.000.

Lockwood, Phyllis, executrix: *See—*
Otto, Carl L., Jr., deceased; and Lockwood, Phyllis, executrix, 3,924,165.

Lockyer, John; and Cleary, Thomas C., to Deutsch Relays, Inc. Relay tester. 3,924,178, Cl. 324-28.00R.

Loev, Bernard, to SmithKline Corporation. 5-Alkoxy-5-heterocyclic-1,2,3,6-tetrahydro-4(5H)-pyrimidinethiones. 3,923,809, Cl. 260-256.50R.

Loev, Bernard: *See—*
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Lohbauer, Kenneth R.: *See—*
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Lohnert, Wolfgang: *See—*
von Benda, Klaus; and Lohnert, Wolfgang, 3,923,542.

Loix, Rene: *See—*
Roeder, Henning; Langner, Gunter P.; Scherhag, Bernd; Nickenig, Hans-Lothar; and Loix, Rene, 3,923,680.

Lombaerde, Charles: *See—*
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Long, Leslie T.: *See—*
Conger, Robert L.; Parks, John A.; and Long, Leslie T., 3,922,968.

Lord Corporation: *See—*
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Lord, Henry A., to Diamond International Corporation. Method for forming molded fiber products with deckle-free windows. 3,923,594, Cl. 162-195.000.

Loschilin, Evgeny Dmitrievich: *See—*
Bulantsev, Anatoly Andreevich; Galperin, Alexandr Lvovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Sakharov, Boris Alexandrovich, 3,923,083.

Louis, Eckhart: *See—*
Nitzsche, Siegfried; Hittmair, Paul; Wohlfarth, Ernst; and Louis, Eckhart, 3,923,736.

Lowery, Dennis J.: *See—*
Dixson, Bruce E.; Gayton, John E.; Lowery, Dennis J.; and Burke, William F., 3,922,909.

Lowy, Stanley Robert, to Unicorn Products Limited. Flights for darts and arrows. 3,923,310, Cl. 273-106.50C.

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Lucas Aerospace Limited: *See—*
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Lucas Electrical Co. Ltd.: *See—*
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Lucas, Matthew J., Jr., to Babcock & Wilcox Company, The. Narrow-groove welding. 3,924,095, Cl. 219-125.00R.

Lucien, Rene; and Masclet, Jean, to Messier Hispano. Disc brake with graphite friction shoes. 3,923,128, Cl. 188-251.00A.

Luckenbach, Edward C.; and Worley, Arthur C., to Exxon Research & Engineering Co. Catalytic hydrocarbon conversion process and apparatus. 3,923,642, Cl. 208-164.000.

Lund, Raymond W., Jr., to Hoerner Waldorf Corporation. Double web corner carton. 3,923,234, Cl. 229-37.00E.

Lundin, Rune: *See—*
Csiki, Kalman; and Lundin, Rune, 3,922,725.

Lunin, Gleb Leonidovich: *See—*
Portnoi, Kim Isaevich; Arabei, Lidia Borisovna; Gryazno, Georgy Mikhailovich; Levi, Lev Izrailevich; Lunin, Gleb Leonidovich; Kozhukhov, Valery Mikhailovich; Markov, Jury Mikhailovich; and Fedotov, Mikhail Egorovich, 3,923,502.

Lussling, Theodor; Schaefer, Hans; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Catalyst for the production of aromatic or hetero-aromatic nitriles. 3,923,819, Cl. 260-294.900.

Luteran, Frank Kenneth. Phase sensitive ignition timing system. 3,923,030, Cl. 123-148.00E.

Lutz, Gottfried: *See—*
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Pertzsch, Albert; Toral, Jose; Lutz, Gottfried; Wilke, Werner; and Riedel, Anton, 3,923,272.

Lynch, James Edward, to AMP Incorporated. Press fitted terminal post. 3,923,365, Cl. 339-221.00R.

Lynn, James B.: *See—*
Homberg, Otto A.; Sheldrake, Charles W.; and Lynn, James B., 3,923,957.

Lyon, Halsey H.; and Deimel, Frank H. Portable sink over-flow device. 3,922,733, Cl. 4-191.000.

M. C. Guarino Associates, Inc.: *See—*
Guarino, Michael C.; and Cacossa, Frank, 3,922,830.

M & H Plastics Inc.: *See—*
Monaghan, Frank, 3,923,604.

M & T Chemicals Inc.: *See—*
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Ma, James W.: *See—*
Klimek, Boleslaw; and Ma, James W., 3,923,346.

Maayani, Saul: *See—*
Sokolovsky, Mordechai; and Maayani, Saul, 3,923,990.

Mabie, Norman H., to L. M. & L Corporation. Belt connector with flexible bite feature. 3,922,759, Cl. 24-31.00B.

Mabuchi, Kenichi; and Tsuchimochi, Toshihisa, to Mabuchi Motor Co. Ltd. Battery connection device. 3,923,549, Cl. 136-134.00P.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi; and Tsuchimochi, Toshihisa, 3,923,549.

Machacek, Hubert: *See—*
Baerns, Manfred; Beck, Bruno; Schmid, Karl Ludwig; Machacek, Hubert; Beige, Gunther; and Nogge, Heinz, 3,923,867.

Mack, Anthony C.; and Shumrak, George K. Mobile food serving system. 3,924,100, Cl. 219-386.000.

MacKenzie, Burton Thornley, Jr., to General Electric Company. Pressureless curing of filled ethylene containing polymeric compositions. 3,923,731, Cl. 260-42.420.

Madden, Baxter C., Jr. Energy absorbing devices. 3,923,292, Cl. 267-64.00R.

Maddox, Robert L., to Owens-Corning Fiberglas Corporation. Machine for unrolling chopping, and feeding matted material. 3,922,937, Cl. 83-99.000.

Maeno, Shizuo: *See—*
Imanaka, Hiroshi; Kamiya, Takashi; Maeno, Shizuo; Miyoshi, Toshio; Miyairi, Norimasa; Aoki, Hatsuo; Kohsaka, Masanobu; Komori, Tadaaki; and Sakai, Heiichi, 3,923,790.

Maggio, Anthony F.: *See—*
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Magnani, Arthur, to SmithKline Corporation. Anti-arthritic compositions comprising a 3-aryl 2-thiohydantoin and methods of producing anti-arthritic acitvity. 3,923,994, Cl. 424-273.000.

Magnavox Company, The: *See—*
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Magner, James E.: *See—*
Basque, Max G.; Magner, James E.; Surls, Joseph P.; and West, Ben F., 3,923,968.

Mahieu, Jean-Rene: *See—*
Fache, Michel; Blondel, Jacques; and Mahieu, Jean-Rene, 3,924,204.

Maier, Alfred E.; and Shimp, Alan B., to Westinghouse Electric Corporation. Circuit breaker with detachably connected fault simulator. 3,924,160, Cl. 317-36.0TD.

Maier, Elmar; and Tilg, Robert, to Hilti Aktiengesellschaft. Explosion charge driven fastening element setting gun. 3,923,225, Cl. 227-8.000.

Maier, Elmar, to Hilti Aktiengesellschaft. Barrel and magazine alignment arrangement for a fastening element setting gun. 3,923,226, Cl. 227-8.000.

Maier, Elmar, to Hilti Aktiengesellschaft. Tapered seal between the barrel and drum type magazine in a fastening element setting gun. 3,923,227, Cl. 227-8.000.

Makita Electric Works Limited: *See—*
Fushiya, Fusao, 3,922,785.

Malinchak, Paul. Inserts for metal cutters. 3,922,766, Cl. 29-105.00R.

Mand Carpet Mills: *See—*
Mand, Emery M.; Amley, Joyce C., deceased; and Amley, Loretta, executrix, 3,922,736.

Mand, Emery M.; Amley, Joyce C., deceased; and by Amley, Loretta, executrix, to Mand Carpet Mills. Machine and method for space dyeing. 3,922,736, Cl. 8-149.000.

Mann, Robert C.: *See—*
Dexter, John B.; and Mann, Robert C., 3,923,275.

Manners, Joseph A., Sr.: *See—*
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Mannesmann Aktiengesellschaft: *See—*
Dorr, Wolfgang; Matzner, Hartwig; and Noska, Tilman, 3,923,091.

Manthey, Peter; and Matthies, Hermann, to Metallgesellschaft Aktiengesellschaft. Method of removing solids (e.g. copper dross) from molten-lead baths. 3,923,499, Cl. 75-78.000.

Marcella, Joseph: *See—*
Emery, Vernon V.; Howe, Charles W.; and Marcella, Joseph, 3,923,443.

Marchant, Ian McGregor, to Kins Development Limited. Rail clip assembly. 3,923,245, Cl. 238-347.000.

Marchello, John L. Bicycle pedal crank extender. 3,922,929, Cl. 74-562.000.

Marcil, Paul M. Wall hook structure and method of forming same. 3,923,278, Cl. 248-301.000.

Marcyan, Stanley T. Motor bike stabilizer. 3,923,220, Cl. 224-42.03B.

Marechal, Jacques Prost; and Tomasik, Georges, to Roussel-UCLAF. Process for the preparation of 16α-methyl-$\Delta^{1,4,9(11)}$-pregnatrien-3,20-diones and use of the same in treatment of allergies. 3,923,985, Cl. 424-243.000.

Margulies, Robert S.; and Biddick, Royce E., to United States of America, Environmental Protection Agency. Grid structure for high rate lead/acid battery. 3,923,545, Cl. 136-36.000.

Marien, Jan A.; and Steinberg, David R., to Corning Glass Works. Method of forming a hermetic enclosure. 3,922,773, Cl. 29-570.000.

Marino, Francis C., to Redactron Corporation. Indicating system using pulsed optical techniques. 3,924,253, Cl. 340-258.00B.

Markey, Robert Harvey, to Multifastener Corporation. Method of making a laminated nut and clip. 3,922,742, Cl. 10-86.00R.

Markov, Jury Mikhailovich: *See—*
Portnoi, Kim Isaevich; Arabei, Lidia Borisovna; Gryazno, Georgy Mikhailovich; Levi, Lev Izrailevich; Lunin, Gleb Leonidovich; Kozhukhov, Valery Mikhailovich; Markov, Jury Mikhailovich; and Fedotov, Mikhail Egorovich, 3,923,502.

Markowitz, Isral J., to Stem Industries, Inc. Compact rotating internal combustion engine. 3,923,018, Cl. 123-43.00A.

Markowitz, Ivan N.: *See—*
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Marley Company, The: *See—*
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Marlow, Ray E.: *See—*
United States of America, National Aeronautics and Space Administration; and Marlow, Ray E., 3,922,930.

Maroshick, Max, to Boeing Company, The. Articulated railway vehicle connecting passage. 3,922,971, Cl. 105-4.00R.

Marquis, Florian E. Lifting boom for truck. 3,923,170, Cl. 214-86.00A.

Marsden, Donald: *See—*
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Marsh, Dana G., to Xerox Corporation. Method for the preparation of relief printing masters. 3,923,514, Cl. 96-35.000.

Marshall, Robert Swinburn; Hartmann, Karl; and Kraffert, Erich, to Lever Brothers Company. Methods for forming unit portions of frozen food materials. 3,924,012, Cl. 426-518.000.

Martin: *See—*
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Martin, Burton L.; and Tilly, Peter E., to Rockwell International Corporation. Shielded indicating lamp fuseholder. 3,924,216, Cl. 337-206.000.

Martin, William E., to United States of America, Navy. High speed electro-optic waveguide modulator. 3,923,374, Cl. 350-96.0WG.

Martin, William E., to United States of America, Navy. Electro-optic waveguide beam deflector. 3,923,376, Cl. 350-96.0WG.

Martinez, Boni Philip; and Zeisberg, Millard David, to Du Pont de Nemours, E. I., and Company. Fuel made from thermoplastic fibers and oil. 3,923,472, Cl. 44-50.000.

Martinsons, Aleksandrs: *See—*
Welch, Cletus N.; and Martinsons, Aleksandrs, 3,923,609.

Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Novel propenylamine derivatives and process for the production thereof. 3,923,794, Cl. 260-240.00A.

Maruyama, Iwao: *See—*
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Maruyama, Tsutomu; and Yamashita, Kazuo, to Kansai Paint Company, Ltd. Method of electron beam curing of coated unsaturated substrates containing silicon carbide. 3,924,021, Cl. 427-35.000.

Marvin Glass & Associates: *See—*
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Masaki, Hideyuki: *See—*
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Maschinenfabrik Gehring KG: *See—*
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MaTek Corporation: *See—*
Davis, William J.; Izbicki, Anthony J.; and Parsley, Johne, 3,923,936.

Matouka, Michael F., to General Motors Corporation. Digital sawtooth generator. 3,924,195, Cl. 328-181.000.

Matsuda, Osamu: *See—*
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Matsuda, Yoshio, to Yoshida Kogyo K.K. Concealed zip fastener. 3,922,760, Cl. 24-205.10C.

Matsui, Hiroshi; Kitahara, Hisao; and Watanabe, Shozo, to Matsushita Electric Industrial Co., Ltd. Electric switch combined with variable resistor. 3,924,220, Cl. 338-172.000.

Matsumoto, Kouichi: *See—*
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Matsumura, Hiroyoshi: *See—*
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Matsuoka, James T.; and Cantarutti, Armindo, to Intercole Automation, Inc. Internal mixer. 3,923,291, Cl. 259-192.000.

Matsushima, Norihisa: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matsuura, Takashi; and Chihara, Fumio, to Hoya Glass Works, Ltd. Colored glass. 3,923,527, Cl. 106-47.00R.

Matthews, Ernest L.; and Matthews, Ralph E., to Matthews Machine Company, Inc. Apparatus for packaging fluid materials in packets. 3,923,084, Cl. 141-144.000.

Matthews Machine Company, Inc.: *See—*
Matthews, Ernest L.; and Matthews, Ralph E., 3,923,084.

Matthews, Ralph E.: *See—*
Matthews, Ernest L.; and Matthews, Ralph E., 3,923,084.

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Matui, Takao: *See—*
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Matuki, Akira: *See—*
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Matzner, Hartwig: *See—*
Dorr, Wolfgang; Matzner, Hartwig; and Noska, Tilman, 3,923,091.

Maurer, Bruno; Fracheboud, Michel G.; and Ohloff, Gunther, to Firmenich S.A. Bicyclic compounds, their use and process for preparing same. 3,923,873, Cl. 260-488.00R.

Maurice, Jean; and Mouttet, Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Crenellation drum; and epicyclic transmission incorporating the same. 3,922,932, Cl. 74-763.000.

Maxey, Robert E. L., Sr.; and Bernard, John, Jr., to Westinghouse Electric Corporation. Profile indicating apparatus displaceable either along an axis or in a plane perpendicular thereto. 3,922,791, Cl. 33-172.00R.

May & Baker Limited: *See—*
Caton, Michael Peter Lear; and Parker, Trevor, 3,923,872.

May, Sam H. Warning device for stalled vehicles. 3,922,998, Cl. 116-40.000.

Mayama, Mikao: *See—*
Shoji, Jun'ichi; Mayama, Mikao; Matsuura, Shinzo; Matsumoto, Kouichi; and Wakisaka, Yoshiharu, 3,923,979.

Mayer, Edward F.: *See—*
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Mayer, Kurt: *See—*
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Mayflower Textiles Co., Inc.: *See—*
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Mazdiyasni, Khodabakhsh S.; and Brown, Leanne M., to United States of America, Air Force. Method for preparing lead lanthanum zirconate-titanate powders. 3,923,675, Cl. 252-62.900.

MCA Disco-Vision, Inc.: *See—*
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McAmish, Larry H.: *See—*
Peters, John P.; and McAmish, Larry H., 3,924,157.

McArdle, Edward H.; and Millidge, Ralph John, to United States of America, Air Force. Fragment suppression configuration. 3,924,038, Cl. 428-49.000.

McCabe, Ralph Patrick, to Colt Industries Operating Corporation. Turbine engine fuel control. 3,922,850, Cl. 60-39.28R.

McCann, Brenda G., heir: *See—*
Hansen, Howard A.; Fulton, Clyde E., deceased; Fulton, Minnie L., heir; and McCann, Brenda G., heir, 3,924,094.

McCarty, Horace G.: *See—*
Kline, Charles M.; Priepke, Edward H.; Waldrop, Thomas W.; Fisher, Raymond E.; Greiner, James G.; and McCarty, Horace G., 3,922,838.

McClure, Robert Bruce. Audio responsive color display system. 3,924,231, Cl. 340-366.00B.

McDonald, Don E.: *See—*
Jhu, Jai Hun; Wells, George H.; Mulder, Thomas J.; and McDonald, Don E., 3,924,109.

McDonald, Reagan W.; and Joseph, Walter B., to McDonald, Reagan W. Deep water platform construction. 3,922,868, Cl. 61-46.500.

McDonald, Wilson C., to Goodyear Aerospace Corporation. Quick attached transparent armor windows. 3,923,339, Cl. 296-95.00R.

McEachern, James F., to United States of America, Navy. Hydrophone drogue. 3,922,989, Cl. 114-209.000.

McFall, Robert A.: *See—*
Engel, Simon L.; and McFall, Robert A., 3,923,383.

McGill, Kenneth Harmon: *See—*
Eddy, Kenneth Harmon; and McGill, Kenneth Harmon, 3,922,825.

McGill, Robert W., to A-T-O Inc. Grid for article caser apparatus. 3,922,836, Cl. 53-248.000.

McIntosh, Robert P.; and Shahein, Hussein I., to International Business Machines Corporation. High density track follower control system for magnetic disk file. 3,924,268, Cl. 360-78.000.

McIntyre, Betty J., administrator: *See—*
McIntyre, James L., deceased, 3,924,153.

McIntyre, James L., deceased (by McIntyre, Betty J., administrator), to Westinghouse Electric Corporation. Electron gun. 3,924,153, Cl. 315-14.000.

McKee, Donald S., to Scott & Fetzer Company, The. Enclosable retractable awning. 3,923,074, Cl. 135-5.0AT.

McKinley, Suzanne V., to Dow Chemical Company, The. Arvinylbenzyl iodide. 3,923,911, Cl. 260-651.00R.

McKinney, Joel D.: *See—*
Christman, Robert D.; McKinney, Joel D.; Readal, Thomas C.; and Yanik, Stephen J., 3,923,637.

McKinney, Ross E., to Vesmat Investments, Inc. Level detection system. 3,923,655, Cl. 210-83.000.

McMillan, Stephen L., to General Electric Company. Clothes dryer. 3,922,798, Cl. 34-73.000.

McNeil Laboratories, Incorporated: *See—*
Rasmussen, Chris Royce, 3,923,801.

MDT Instrument Company: *See—*
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Mead Corporation, The: *See—*
Calvert, Rodney K., 3,923,236.

Mead Johnson & Company: *See—*
Comer, William T.; and Catt, John D., 3,923,886.

Mead, Theodore C.; Odell, Norman R.; and Shillinglaw, John P., Jr., to Texaco Inc. Production of lubricating oils. 3,923,636, Cl. 208-58.000.

Meador, Jim D.: *See—*
Parker, Edward H.; Harris, Edward M.; and Meador, Jim D., 3,923,761.

Mechulam, Andre; Saintours-Payerne, Bruno M.; Gay-Chatain, Guillaume A.; and Montjallard, Paul R., to Etat Francais. Gun turret with an observation opening closable by a hatch cover. 3,922,949, Cl. 89-36.00L.

Medicor Muvek: *See—*
Hajdu, Laszlo; Hegyessy, Gyorgy; Balla, Jozsef; and Vitan, Gabor, 3,923,042.

Medtronic, Inc.: *See—*
Stasz, Peter; and Cosentino, Louis C., 3,923,041.

Meginnis, Charles E. Sight glass with wear indicating device. 3,922,999, Cl. 116-114.00Q.

Melancon, Lionel P., to United States of America, Navy. Aural warning apparatus. 3,924,262, Cl. 340-27.0AT.

Melnikov, Nikolai Nikolaevich; Grapov, Artur Felixovich; Kozlova, Tamara Fedorovna; Shakhova, Galina Borisovna; Pokatun, Valery Pavlovich; Stonov, Leonid Dmitrievich; Bakumenko, Ljudmila Alexandrovna; Sergeeva, Tatyana Akimovna; and Titova, Lidia Mikhailovna. Herbicide. 3,923,493, Cl. 71-87.000.

Meloy Laboratories, Inc.: *See—*
Barden, James D., 3,923,461.

Menard, Emile, Jr. Method and apparatus for raising and retrieving a boat anchor. 3,922,990, Cl. 114-221.00R.

Mendel, Arthur, to Riker Laboratories, Inc. Polyfluoroalkoxy-substituted aromatic carboxylic acids. 3,923,885, Cl. 260-544.00M.

Mendel, Arthur: *See—*
Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertsoh, Jerry E., 3,923,810.
Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 3,923,811.

Mengkrog, Oystein: *See—*
Stemsrud, Finn; Ullevalseter, Reidar Otto; and Mengkrog, Oystein, 3,922,908.

Mentzer, Carl A.: *See—*
United States of America, National Aeronautics and Space Administration; Peters, Leon, Jr.; and Mentzer, Carl A., 3,924,237.

Merck & Co., Inc.: *See—*
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Shen, Tsung-Ying; and Jones, Howard, 3,923,859.
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Merianos, John J.: *See—*
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Merle, Michel: *See—*
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Merriman, Burt Trosey, Jr.: *See—*
Welstead, William John, Jr.; and Merriman, Burt Trosey, Jr., 3,923,988.

Mertens, William J., to Avco Corporation. Closed-breech-gun-fired rocket-assisted projectile. 3,922,967, Cl. 102-38.000.

Merz, Herbert; Langbein, Adolf; Walther, Gerhard; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing an n-furyl-or thienyl-methyl)- -oxy-7,8 -dihydronormorphinone or norcodeinone and method of use. 3,923,987, Cl. 424-260.000.

Mesnil, Paul; Talvard, Jean-Pierre; and Flaceliere, Bernard. Device for acquisition, storage and echelon of characters in a printer of the series type. 3,923,139, Cl. 197-19.000.

Messerschmitt-Bolkow-Blohm G.m.b.H.: *See—*
Krehan, Friedrich Wilhelm, 3,922,948.

Messier Hispano: *See—*
Lucien, Rene; and Masclet, Jean, 3,923,128.

Metallgesellschaft Aktiengesellschaft: *See—*
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Metten, Josef: *See—*
Weissel, Oskar; Metten, Josef; Schwarz, Hans Helmut; Koller, Horst; and Tacke, Peter, 3,923,695.

Metzger, Karl-Georg: *See—*
Schrock, Wilfried; Metzger, Karl-Georg; and Konig, Hans-Bodo, 3,923,789.

Meuly, Walter C., to Rhodia Inc. Process for repelling dogs and cats from a selected area or from each other using γ-n-alkyl-γ-butyrolactones and δ-n-alkyl-δ-valerolactones. 3,923,997, Cl. 424-279.000.

Meyer, Hans Rudolf, to Ciba-Geigy AG. Distyrylbenzene derivatives. 3,923,878, Cl. 260-505.00C.

Meyer, Horst: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,923,818.

Meyer, James A., to Brunswick Corporation. Steering apparatus for outboard motors. 3,922,996, Cl. 115-18.00R.

Meyer, Rene, to Ugine Carbone. Composite materials. 3,923,946, Cl. 264-111.000.

Mez, Georg. Flange connection. 3,923,326, Cl. 285-363.000.

Michaels, Alan S.: *See—*
Baker, Richard W.; Michaels, Alan S.; and Theeuwes, Felix, 3,923,939.

Michalski, Raymond J.; and Youngs, Roger W., to Nalco Chemical Company. Amides and hydrophobic silica as antifoams. 3,923,683, Cl. 252-321.000.

Mickelson, Thorwald J. Semitrailer king pin securing device. 3,922,897, Cl. 70-232.000.

Micro Devices Corporation: *See—*
Plasko, Emil Robert, 3,924,214.
Plasko, Emil Robert; Kohl, James Allen; and Hutchison, Michael Raymond, 3,924,217.
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Miletto, Andre: *See—*
Fassy, Henri; Lalet, Philippe; and Miletto, Andre, 3,923,764.

Mill Supply, Inc.: *See—*
Stearns, George H., 3,923,149.

Miller, David. Eye lid blinker. 3,923,044, Cl. 128-25.00A.

Miller, Donald J.; and Rolie, Gil G., to Synergex Corporation. Container with springloaded closure. 3,923,196, Cl. 220-335.000.

Miller, Douglas D.: *See*—
Hillegas, Danny H.; Miller, Douglas D.; and Varga, John F., 3,922,901.
Miller, Forrest A.; Wirsching, Michael T.; and Hosick, Frank A., to K-2 Corporation. Size adjustable ski boot. 3,922,800, Cl. 36-2.5AL.
Miller, Frances M.: *See*—
Powers, John R.; and Miller, Frances M., 3,923,768.
Miller, Harold C., to Engelhard Minerals & Chemicals Corporation. Liquid pick-up unit and method for a pavement grooving machine. 3,923,341, Cl. 299-18.000.
Miller, Joseph J., to Big Drum, Inc. Feeder for sleeve-enclosed edible cones. 3,923,200, Cl. 221-221.000.
Miller, Roman R.: *See*—
Williams, Dale D., and Miller, Roman R., 3,922,904.
Miller, Russell C., to J. M. Eltzroth & Associates, Inc. Treating metal with a cleaning agent in a combustible solvent before coating. 3,924,035, Cl. 427-327.000.
Millidge, Ralph John: *See*—
McArdle, Edward H.; and Millidge, Ralph John, 3,924,038.
Millmaster Onyx Corporation: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,923,973.
Mills, Frank J. E.: *See*—
Uebelhart, James J.; Spicuzza, John P., Jr.; and Mills, Frank J. E., 3,923,706.
Mills, Truett P. Slotted golf putter. 3,923,308, Cl. 273-183.00D.
Milton, A. Fenner, to United States of America, Navy. High angle optical ray separator. 3,923,377, Cl. 350-96.00C.
Minamizaki, Kunio; Yagi, Yasuhiko; Murakami, Kensuke; and Kurose, Hisayuki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for building liquefied-gas-carrier. 3,922,986, Cl. 114-74.00A.
Minks, Floyd M. Voltage regulator for alternating current lighting system. 3,924,154, Cl. 315-78.000.
Minneman, William J., to MTM Molded Products Company. Flat pack for revolver cartridges. 3,923,152, Cl. 206-3.000.
Minnesota Mining and Manufacturing Company: *See*—
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Braun, David L., 3,924,219.
Brochman, Wilfred R., 3,923,198.
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Gobran, Ramsis; Knoepfel, Hanspeter; and Silver, Spencer F., 3,924,044.
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Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 3,923,810.
Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 3,923,811.
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Minolta Camera Kabushiki Kaisha: *See*—
Nakamura, Akiyoshi, 3,923,369.
Mishcon, Lester, to Singer Company, The. Positive yarn feeding system for circular knitting machine. 3,922,887, Cl. 66-132.00T.
Mita Industrial Company, Ltd.: *See*—
Washio, Takaji; Sasaki, Koichi; and Aizawa, Tatsuo, 3,923,391.
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Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsubishi Mining & Cement Company Ltd.: *See*—
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Mitsui Toatsu Chemicals, Incorporated: *See*—
Asano, Shiro; Yoshimura, Kiyotaka; Tsuchiya, Ryoji; and Honda, Tadatoshi, 3,923,741.
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Miyake, Hideo; and Fuzimura, Toshiaki, to Toyo Boseki Kabushiki Kaisha. Polyester composition containing saturated polyester unsaturated terephthalate polyester and vinyl monomer. 3,923,927, Cl. 260-861.000.
Miyamori, Hiroshi: *See*—
Yonemitsu, Eiichi; Miyamori, Hiroshi; Takeda, Mutsuhiko; and Sasaki, Yukio, 3,923,884.
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Miyasaka, Kenzi; Takemoto, Mikio; Kato, Yoshiaki; Uematu, Hiroyuki; Tamaru, Munetaka; Kume, Kazunari; Ohno, Hideshi; and Onda, Mitsuo, to Citizen Watch Co., Ltd. Watch drive pulse motor. 3,922,845, Cl. 58-23.00D.
Miyashiro, Shoichi; Shirouzu, Shunji; Shimizu, Kazuo; and Yoshida, Okio, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing an image pickup tube. 3,923,358, Cl. 316-19.000.
Miyata, John J.: *See*—
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Watanabe, Etsuji; Miyazaki, Tsutomu; Kato, Takashi; and Miyamoto, Noriaki, 3,922,840.
Miyoshi, Toshio: *See*—
Imanaka, Hiroshi; Kamiya, Takashi; Maeno, Shizuo; Miyoshi, Toshio; Miyairi, Norimasa; Aoki, Hatsuo; Kohsaka, Masanobu; Komori, Tadaaki; and Sakai, Heiichi, 3,923,790.
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Mizokami, Nariakira: *See*—
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Mollinger, Sebastian. Roofing assembly of flexible material. 3,922,822, Cl. 52-63.000.
Molyneux, George. Building construction. 3,922,826, Cl. 52-204.000.
Monaghan, Frank, to M & H Plastics Inc. Tubular articles. 3,923,604, Cl. 195-139.000.
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Monsanto Company: *See*—
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Fields, Joseph E.; and Johnson, John H., 3,923,972.
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Moore, Edwin Barclay; Crossley, Bernard Oliver; and Gladwell, Roy Leonard, to Dunlop Limited. Cable spacer for overhead power transmission lines. 3,924,055, Cl. 174-40.00R.
Moore, Phylis T., to Polaroid Corporation. Novel 4,4'-bipyridinium salts. 3,923,821, Cl. 260-296.00D.
Moore, Robert A.: *See*—
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Moran, Gonzalo, to Comercial Super-Dix, S.A. Air treatment device. 3,923,458, Cl. 21-74.00R.

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Morman, Frank C., to American Can Company. Zinc lignosulfonate stabilizing binder solution for magnesium oxide refractory forming mixtures and method. 3,923,532, Cl. 106-59.000.
Morris, Allen H. Tool for edging around sprinkler heads. 3,923,102, Cl. 172-13.000.
Morris, Herman H. Flooder refrigerant condenser systems. 3,922,880, Cl. 62-498.000.
Morris, Thomas M.; and Bilson, Edward A., to Inspiration Consolidated Copper Company. Electrolytic recovery of zinc. 3,923,617, Cl. 204-119.000.
Morris, William F., Jr. Refrigeration system with auxiliary defrost heat tank. 3,922,875, Cl. 62-156.000.
Morrison, Roger A., to Mobil Oil Corporation. Hydrocracking naphthas using zeolite beta. 3,923,641, Cl. 208-111.000.
Morse, Donald B.; and Pribish, Bernard A., to Kemlite Corporation. Machine for trimming the edges of panels. 3,922,940, Cl. 83-364.000.
Mortenson, Charles L.: *See—*
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Mouille, Rene Louis. Damped elastic tie device between rotor blade and hub on rotary-wing aircraft. 3,923,419, Cl. 416-107.000.
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Mulder, Thomas J.: *See—*
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Mullaney, Paul F.: *See—*
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Muller, Hans, to Grapha-Holding AG. Apparatus for placing cover sheets on stacks of different heights. 3,923,145, Cl. 198-35.000.
Muller, Peter, to Andrews Paper & Chemical Co. Erasable diazotype material with vinyl chloride and methyl acrylate copolymer interlayer. 3,923,518, Cl. 96-75.000.
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Muller, Richard: *See—*
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Multifastener Corporation: *See—*
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Ladouceur, Harold A., 3,923,089.
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Mundlos, Eberhard; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Hydroxynaphtholdehide monoazomethine amine dyestuffs. 3,923,793, Cl. 260-240.00F.
Munksjo Aktiebolag and Pelly AB: *See—*
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Murayama, Naohiro; Katto, Takayuki; and Ichii, Takao, to Kureha Kagaku Kogyo K.K. Process for irradiating a mixture of vinylidene fluoride polymer and a propargyl-containing crosslinking agent and product thereof. 3,923,621, Cl. 204-159.170.
Murdock, Robert M. Flag pole. 3,923,001, Cl. 116-173.000.
Murib, Jawad H.; and Frank, Charles E., to National Distillers and Chemical Corporation. Process for the preparation of C_5 dicarboxylic acids from 2-butene. 3,923,881, Cl. 260-533.00R.
Murray, Kenneth M., to United States of America, Navy. Activated aluminum tracer tag. 3,924,125, Cl. 250-303.000.
Murtagh, Marjorie Mary: *See—*
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Myers, David M.: *See—*
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Myers, Dwight L., to Water-Boggan, Inc. Amusement water slide and method. 3,923,301, Cl. 272-56.50R.
Myers, Herman A., to Innovate, Inc. Rotary engine. 3,923,013, Cl. 123-8.470.
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Naber, Charles T.; and Blust, William F., to NCR Corporation. Process for fabricating MNOS non-volatile memories. 3,924,024, Cl. 427-95.000.
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Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, to Bristol-Myers Company. 5''-Amino-4',5''-dideoxyambutyrosin. 3,923,783, Cl. 260-210.0AB.
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Nakajima, Heitaro; Kawakami, Hirotake; Tatara, Shokichi; and Kishigami, Jun, to Sony Corporation. Cartridge shell for phonograph pickup. 3,923,309, Cl. 274-23.00R.
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Nakajima, Nobuhiro; Nakatsugawa, Shiro; Koyama, Yasuo; and Chihara, Shiro, to Kayaku Antibiotic Research Co., Ltd. Gatavalin and process for producing same. 3,923,978, Cl. 424-118.000.
Nakajima, Nobuyoshi. Power driven typewriter. 3,923,136, Cl. 197-17.000.
Nakakobara, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotor housing of a rotary engine. 3,923,432, Cl. 418-61.00A.
Nakamura, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Retrofocus type of objective lens. 3,923,369, Cl. 350-214.000.
Nakamura, Koichi, to Kabushiki Kaisha Suwa Seikosha. Cash register. 3,924,108, Cl. 235-152.000.

Nakamura, Tsutomu: *See—*
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Braithwaite, David G.; Cross, Carl F.; and Basila, Michael R., 3,923,692.
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Namito, Yoshio; Kobayashi, Masahiro; and Kojima, Takeshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Synthesis of 5-(beta-methylmercaptoethyl)-hydantoin. 3,923,826, Cl. 260-309.500.

Narayanan, Venkatachala L., to E. R. Squibb & Sons, Inc. Aminoalkoxy-tetrahydro-cyclopropa [b]naphthalenes. 3,923,890, Cl. 260-570.700.

Naro, Paul A.: *See—*
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Nastronero, John J.; and Billings, John C., to United States of America, Navy. Active-passive target detection system. 3,924,233, Cl. 343-6.00R.

National Distillers and Chemical Corporation: *See—*
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National Research Development Corporation: *See—*
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National Steel Corporation: *See—*
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Naud, Royce E., to Texas Instruments Incorporated. System for building OP codes. 3,924,242, Cl. 340-172.500.

Naumenko, Igor Mikhailovich: *See—*
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Gordy, Robert S.; Sanders, David E.; and Anderson, Alfred T., 3,924,186.
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Nelson, Norman A., to Upjohn Company, The. 3-Oxa prostaglandin F -type compounds. 3,923,861, Cl. 260-468.00D.

Nelson, Norman A., to Upjohn Company, The. 4-Oxa prostaglandin β-type compounds. 3,923,862, Cl. 260-468.00D.

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Nelson, Norman A., to Upjohn Company, The. 4-Oxa prostaglandin Fβ-type compounds. 3,923,865, Cl. 260-468.00D.

Nettesheim, Gottfried: *See—*
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Newingham, Thomas D.; and Recchuite, Alexander D., to Sun Oil Company of Pennsylvania. Antiwear hydraulic oil. 3,923,669, Cl. 252-32.70E.

Newman, James W.; Bavaro, Nicholas M.; and Zajac, Ronald E., to Windings, Inc. Package of flexible material with radial opening extending into a central axial opening and means for preventing inward collapse. 3,923,270, Cl. 242-163.000.

Newsam, William, to Pressey Handel und Investments A.G. Multi-layer printed-circuit boards. 3,923,359, Cl. 339-17.00M.

Ney, Karl Heinz; Wirotama, I. Poetoe Gde; and Freytag, Wolfram Gustav, to Lever Brothers Company. Provolone cheese flavor. 3,924,014, Cl. 426-534.000.

Ngo, Charles C. M., to Litton Systems, Inc. Magnetic core matrix and winding pattern for mass core memory. 3,924,250, Cl. 340-174.0CR.

Nicholas, Michael G.; Scott, Peter M.; and Dewar, Bruce I., to De Beers Industrial Diamond Division Limited. Method for metal coating diamonds so as to improve the interfacial bond strength. 3,924,031, Cl. 427-217.000.

Nickenig, Hans-Lothar: *See—*
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Niedrach, Leonard W.; and Stoddard, William H., Jr., to General Electric Company. Miniature probe containihg multifunctional electrochemical sensing electrodes. 3,923,626, Cl. 204-195.00R.

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Niegisch, Walter D.: *See—*
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Niemann, Heinz, to ESGEE-Marby GmbH & Co., Firma. Cycle luggage carrier construction, particularly light-weight bicycle luggage carrier. 3,923,218, Cl. 224-32.00A.

Nihon Itagarasu Kabushiki Kaisha: *See—*
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Niinomi, Naoyuki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument provided with a voltage-controlled monophonic playing section operated by a manual or pedal tone-playing section. 3,922,943, Cl. 84-1.170.

Nijdam, Ate, to Aannemers, Combinatie Zinkwerken B.V. Mattress, method of sinking a mattress and vessel suitable for use in said method. 3,922,865, Cl. 61-38.000.

Nikolaus, Harold W.: *See—*
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Nilsson, Alvar Erling: *See—*
Johansson, Karl Olof; Nilsson, Alvar Erling; and Skarfelt, Hans TorBjorn, 3,923,187.

Nimer, Fred. Semi-automatic pipe loader. 3,923,085, Cl. 141-261.000.

Ninagawa, Yoichi: *See—*
Nishida, Takashi; Ninagawa, Yoichi; Omura, Yoshiaki; Mori, Fumio; Tamai, Yoshim; Hosogai, Takeo; Fujita, Yoshiji; and Itori, Kazno, 3,923,918.

Nippon Columbia Kabushiki Kaisha: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Oil Company Ltd.: *See—*
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Nippon Oil Seal Industry Co., Ltd.: *See—*
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Nippon Oils and Fats Company Limited: *See—*
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Nippon Sheet Glass Co., Ltd.: *See—*
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Nippon Soda Company, Ltd.: *See—*
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Nippon Steel Corporation: *See—*
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Nippon Steel Welding Products Engineering Co., Ltd.: *See—*
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Nippon Toki Kabushiki Kaisha: *See—*
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Nippondenso Co., Ltd.: *See—*
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Nishida, Takashi; Ninagawa, Yoichi; Omura, Yoshiaki; Mori, Fumio; Tamai, Yoshim; Hosogai, Takeo; Fujita, Yoshiji; and Itori, Kazno, to Kuraray Co., Ltd. Diacetylene diol derivatives and process for preparing the same. 3,923,918, Cl. 260-676.000.

Nishikawa, Satoshi: *See—*
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Nishikubo, Tadatomi; Kishida, Masahiko; and Imaura, Masakazu, to Nippon Oil Seal Industry Co., Ltd. Photocurable composition and a method of preparing same. 3,923,523, Cl. 96-115.00P.

Nishimura, Shinzo: *See—*
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Nishioka, Michihiro: *See—*
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Nishiumi, Shiro: *See—*
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Nitto Shoji Kabushiki Kaisha: *See*—
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Nitzsche, Siegfried; Hittmair, Paul; Wohlfarth, Ernst; and Louis, Eckhart, to Wacker-Chemie G.m.b.H. Room temperature vulcanizable organopolysiloxanes. 3,923,736, Cl. 260-46.50G.

Nocerino, Anthony J. Device for interrupting or completing an electric circuit. 3,924,162, Cl. 317-134.000.

Nogge, Heinz: *See*—
Baerns, Manfred; Beck, Bruno; Schmid, Karl Ludwig; Machacek, Hubert; Beige, Gunther; and Nogge, Heinz, 3,923,867.

Nomura, Yasuji; Koike, Koichi; and Yamamoto, Kazuo, to Hitachi Medical Corporation. X-ray inspection equipment for baggage. 3,924,064, Cl. 178-6.800.

Nonaka, Masakatsu; and Onuma, Toshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Steering apparatus for vehicles. 3,923,319, Cl. 280-87.00R.

Norby, Thomas E.: *See*—
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Nordsiek, Karl-Heinz: *See*—
Berg, Gerhard; and Nordsiek, Karl-Heinz, 3,923,707.

Norges Landbrukshogskole: *See*—
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Norpak Machines Limited: *See*—
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Northern Electric Company Limited: *See*—
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Nosco Plastics, Inc.: *See*—
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Nose, Sawami: *See*—
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Noska, Tilman: *See*—
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Nouvet, Andre: *See*—
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Nozick, Jerome; and Barr, Alvin. Embolectomy catheter. 3,923,065, Cl. 128-348.000.

Nuesch, Jakob: *See*—
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Nuijens, Hubertus Ludovicus Cornelius; Doedee, Robert Theodorus Maria; and Snethorst, Adrianus Cornelis Josephus Maria, to U.S. Philips Corporation. Battery of primary cells. 3,923,547, Cl. 136-107.000.

N.V. Maatschappij voor Industriele Research en Ontwikkeling: *See*—
Glastra, Hendrik, 3,922,970.

O'Brien, John B.; and Stone, Herman, to Allied Chemical Corporation. Growth regulants for plants. 3,923,491, Cl. 71-76.000.

O'Brien, Raymond A., to Cleveland Hardware and Forging Company. Filter cartridge for water coolers. 3,923,662, Cl. 210-251.000.

Ochiai, Michihiko: *See*—
Horii, Satoshi; Mizokami, Nariakira; Fujino, Masahiko; Shinagawa, Susumu; Ochiai, Michihiko; and Okutani, Tetsuya, 3,923,798.

Ochsner, Rolf H., to Robertshaw Controls Company. Pressure responsive magnetic switch. 3,924,086, Cl. 200-82.00R.

Oda, Shinichi: *See*—
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Odell, Norman R.: *See*—
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Ogasawara, Masafumi; Hirai, Keio; Yamaguthi, Nobu; Tsunekawa, Akio; Mizoguchi, Tosiyuki; and Nishiumi, Shiro, to Toray Industries, Inc. Apparatus for making filler materials. 3,922,756, Cl. 19-148.000.

Ogasawara, Masafumi; Akita, Masanori; Saito, Kazuhiko; Kikuchi, Yoshikazu; and Shiokawa, Mitsuhiro, to Toray Industries, Inc. Multilayer conjugate fiber and process and apparatus for the preparation thereof. 3,924,045, Cl. 428-373.000.

Ogden, John F.: *See*—
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Ogle, David G.; and Taylor, John T., to Beckman Instruments, Inc. Microflow metering pump. 3,922,957, Cl. 92-137.000.

Ogle, Robert W., to IMS Limited. Medicament injector. 3,923,059, Cl. 128-237.000.

Oguri, Yasufumi: *See*—
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Oh, Chan Soo; and Pasierb, Edward F., to RCA Corporation. Liquid crystal compositions. 3,923,685, Cl. 252-408.0LC.

O'Hern, Harold A., deceased; and by Hickey, William P., executor, to Owens-Illinois, Inc. Ultrafiltration membrane. 3,923,654, Cl. 210-75.000.

Ohlin, Erik Lars, to Swelab Instrument AB. Liquid dispensing device. 3,923,205, Cl. 222-309.000.

Ohloff, Gunther: *See*—
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Ohlschlager, Hans; Riester, Oskar; Ghys, Theofiel Hubert; Verhille, Karel Eugeen; and Vanheertum, Johannes Josephus, to Agfa-Gevaert Aktiengesellschaft. Sensitized electrophotographic layers. 3,923,507, Cl. 96-1.600.

Ohmori, Yasuro: *See*—
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Ohno, Hideshi: *See*—
Miyasaka, Kenzi; Takemoto, Mikio; Kato, Yoshiaki; Uematu, Hiroyuki; Tamaru, Munetaka; Kume, Kazunari; Ohno, Hideshi; and Onda, Mitsuo, 3,922,845.

Ohorodnik, Alexander; Gehrmann, Klaus; Legutke, Gunter; and Vierling, Hermann, to Hoechst Aktiengesellschaft. Production of monovinylacetylene. 3,923,917, Cl. 260-678.000.

Oji Paper Co., Ltd.: *See*—
Hata, Yukinori; Komiya, Hidetoshi; Osabe, Yuzuru; Watanabe, Tutomu; and Yamada, Hiroyoshi, 3,923,522.

Okano, Akira; Moritani, Yoichi; and Murakami, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Circuit for reproducing reference carrier wave. 3,924,197, Cl. 329-104.000.

Oki, Masami: *See*—
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,923,698.

Oksala, Aake Fritiof; Hultberg, Bror Arne Vilhelm; and Svensson, Sven Erik, to AB Volvo. Device for tilting automobile bodies on automobile body assembly lines. 3,923,296, Cl. 269-60.000.

Okutani, Tetsuya: *See*—
Horii, Satoshi; Mizokami, Nariakira; Fujino, Masahiko; Shinagawa, Susumu; Ochiai, Michihiko; and Okutani, Tetsuya, 3,923,798.

Olashaw, William Francis, to General Electric Company. Stab electrical connector. 3,923,366, Cl. 339-252.00P.

Olashaw, William Francis; and Wilbur, Roger Thomas, to General Electric Company. Electrical switchboard with insulated, isolated bus. 3,924,161, Cl. 317-120.000.

Olcott, Eugene L., to Atlantic Research Corporation. Process of making pyrolytic graphite-silicon carbide microcomposites. 3,924,034, Cl. 427-228.000.

O'Leary, Kevin J.: *See*—
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Kober, Ehrenfried H.; and Schnabel, Wilhelm J., 3,923,850.
Pivawer, Philip M., 3,923,844.
Shapiro, Stanley; and Caron, Ronald N., 3,923,555.
Shapiro, Stanley; Pryor, Michael J.; and Caron, Ronald N., 3,923,558.

Oliver, Stephen Edward; and Winch, Nicholas Richard, to General Electric Company Limited, The. Conference circuits for use in telecommunications systems. 3,924,082, Cl. 179-18.0BC.

Olympia Werke AG: *See*—
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Omura, Yoshiaki: *See*—
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Ong, Sienling; Grossmann, Max; and Karsunky, Ulrich, to Hoechst Aktiengesellschaft. Mixtures of fixing auxiliaries containing novel dye carrier. 3,923,457, Cl. 8-169.000.

Ono, Hisatake; Katsuyama, Harumi; and Watarai, Shu, to Fuji Photo Film Co., Ltd. Spiro (indoline-2,5-isoxazoline) compounds. 3,923,824, Cl. 260-307.00F.

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Oh, Chan Soo; and Pasierb, Edward F., 3,923,685.

Readal, Thomas C.: *See—*
Christman, Robert D.; McKinney, Joel D.; Readal, Thomas C.; and Yanik, Stephen J., 3,923,637.

Real, Kenneth A., to Interface Mechanisms, Inc. Label stripping apparatus for use with label handling apparatus. 3,923,199, Cl. 221-73.000.

Reber, Walter, to Kuhn S.A. Device for extracting and shredding fodder. 3,923,257, Cl. 241-101.700.

Recalde, Carlos Eduardo, to Santa Fe International Corporation. Stinger latching apparatus. 3,922,870, Cl. 61-72.300.

Recchuite, Alexander D.: *See—*
Newingham, Thomas D.; and Recchuite, Alexander D., 3,923,669.

Rechter, Harold L.: *See—*
Parsons, Joseph R.; and Rechter, Harold L., 3,923,531.

Redactron Corporation: *See—*
Marino, Francis C., 3,924,253.

Redmore, Derek, to Petrolite Corporation. Use of 1,2-dihydropyridine-N-phosphonates and thiophosphonates as microbiocides. 3,923,490, Cl. 71-67.000.

Reed Tool Company: *See—*
Peck, James A., 3,923,348.

Reese, Richard G., to Combustion Power Company, Inc. Method and apparatus for feeding solid waste to a fluid bed disposal apparatus. 3,922,975, Cl. 110-8.00F.

Regie Nationale des Usines Renault: *See—*
Maurice, Jean; and Mouttet, Andre, 3,922,932.

Regier, Robert B., to Phillips Petroleum Company. Olefin disproportionation catalyst and process for using same. 3,923,920, Cl. 260-683.00D.

Regife Vega, Jose Manuel; and Diaz Nogueira, Eduardo. Process for recovery of zinc from solutions that contain it as a result of extraction with solvents for their adaptation to electrolysis. 3,923,976, Cl. 423-99.000.

Regitz, Lester J., to United States Steel Corporation. Low-carbon steel sheets temper-rolled after the final anneal to improve magnetic properties. 3,923,560, Cl. 148-120.000.

Reichel, Richard C.: *See—*
Lazar, Remus I.; and Reichel, Richard C., 3,923,453.

Reid, William P. Fluid purification device. 3,923,663, Cl. 210-251.000.

Reil, Wilhelm, to Altstadter Verpackungs Vertriebs GmbH. Apparatus for packaging under sterile conditions. 3,922,835, Cl. 53-167.000.

Reilly, James J.; and Wiswall, Richard H., Jr., to United States of America, Energy Research and Development Administration. Iron titanium manganase alloy hydrogen storage. 3,922,872, Cl. 62-48.000.

Reiner, Lawrence L.; and Brady, William A. Combined game of chance and skill. 3,923,305, Cl. 273-126.00R.

Reis, August: *See—*
Eibl, Volker; and Reis, August, 3,923,632.

Reiss, Karl-Hanz, to Siemens Aktiengesellschaft. Device for measuring density of substances by penetrating rays. 3,924,133, Cl. 250-408.000.

Reitsma, David: *See—*
Katz, Murray; Smith, Stanley W.; and Reitsma, David, 3,923,546.

Renard, Charles J.; and Rifken, Louis L. Portable luggage or load carrier. 3,923,318, Cl. 280-35.000.

Renold Limited: *See—*
Foster, Kenneth William Samuel, 3,922,956.

Repco Research Propietary Limited: *See—*
Hadaway, Bernard Milton, 3,923,315.

Research Corporation: *See—*
Davis, Joseph R., 3,923,775.

Revesz, Robert N.: *See—*
Sitek, George J.; and Revesz, Robert N., 3,923,464.

Reys, John: *See—*
Lawler, Harry A.; and Reys, John, 3,923,314.

Rezazadeh, Reza. Rest accommodation compartment and complex. 3,923,134, Cl. 194-9.00T.

Rhodia Inc.: *See—*
Meuly, Walter C., 3,923,997.

Rhone-Poulenc S.A.: *See—*
Costantini, Michel; Crenne, Noel; Jouffret, Michel; and Nouvel, Jacques, 3,923,895.
Francisoud, Jacques; and Sausse, Andre, 3,923,066.

Rhone-Poulenc-Textile: *See—*
Hautemont, Jean-Claude; and Sartopi, Rolland, 3,922,938.
Isoard, Bernard; and Morf, Jacques, 3,923,261.
Porte, Pierre, 3,923,587.

Rhone-Progil: *See—*
Arpin, Rene, 3,923,718.
Dumont, Rene; Goharel, Maurice; and Lafont, Jean-Claude, 3,923,839.

Riat, Henri: *See—*
de Montmollin, Rene; and Riat, Henri, 3,923,778.

Ribka, Joachim; Piesch, Steffen; Engelhardt, Friedrich; Pfeiffer, Gerhard; Klinke, Peter; and Schidlo, Wolfram, to Cassella Farbwerke Mainkur Aktiengesellschaft. Dyes and pigmented articles wherein the fixing agent is a polymer based on N-formyl-N-acryloylmethylenediamines. 3,924,046, Cl. 428-375.000.

Riccio, Pasquale R., to Ciba-Geigy Corporation. Non-spitting liquid dispensing device with pressurized product supply. 3,923,202, Cl. 222-145.000.

Richardson, Ralph W. Pelletized fertilizer. 3,923,489, Cl. 71-61.000.

Richmond, Henry: *See—*
Song, John; and Richmond, Henry, 3,923,869.

Ricoh Co., Ltd.: *See—*
Iwasaki, Kyuhachiro, 3,923,140.
Ukai, Takeshi; Yaeshima, Masao; and Watanabe, Kimio, 3,924,171.

Rideout, Walker H.; and Glenn, Palmer S., to PPG Industries, Inc. Method for purification of hydrogen chloride. 3,923,963, Cl. 423-481.000.

Ridley, Dennis: *See—*
Ford, Andrew George; and Ridley, Dennis, 3,924,008.

Riedel, Anton: *See—*
Pertzsch, Albert; Toral, Jose; Lutz, Gottfried; Wilke, Werner; and Riedel, Anton, 3,923,271.
Pertzsch, Albert; Toral, Jose; Lutz, Gottfried; Wilke, Werner; and Riedel, Anton, 3,923,272.

Riefel, Guenther: *See—*
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Riegel Textile Corporation: *See—*
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Riester, Oskar: *See—*
Ohlschlager, Hans; Riester, Oskar; Ghys, Theofiel Hubert; Verhille, Karel Eugeen; and Vanheertum, Johannes Josephus, 3,923,507.

Rieth, James E.; and Booth, William M., to Rieth, James E. Controlled trolling apparatus. 3,922,808, Cl. 43-4.000.

Rifken, Louis L.: *See—*
Renard, Charles J.; and Rifken, Louis L., 3,923,318.

Riggi, Stephen Joseph: *See—*
Albright, Jay Donald; Riggi, Stephen Joseph; and Shepherd, Robert Gordon, 3,924,001.

Riggs & Lombard, Inc.: *See—*
Holm, William J., 3,922,738.
Holm, William J., 3,922,752.

Righele, Giovanni Battista; and Scorzato, Giuseppe. Rotary pump for feeding a continuous sausage-making machine. 3,922,755, Cl. 17-33.000.

Rikagaku Kenkyusho: *See—*
Horikoshi, Koki, 3,923,598.

Riker Laboratories, Inc.: *See—*
Mendel, Arthur, 3,923,885.
Petracek, Francis J., 3,923,900.

Riley, Thomas N.; and Hale, Danny B., to University of Mississippi, The. Analgetic composition and method of use. 3,923,992, Cl. 424-267.000.

Riseman, John H.: *See—*
Frant, Martin S.; Ross, James; and Riseman, John H., 3,923,608.

Rite Autotronics Corporation: *See—*
Schwartz, Edwin L., 3,924,185.

Ritter, John W.: *See—*
Hilmer, Milton; Ritter, John W.; and Jiandani, Niranjan, 3,923,483.

Rittig, Falk: *See—*
Synnatschke, Gotthard; Gueckel, Walter; and Rittig, Falk, 3,923,999.

Ritz, William C., to United States of America, Energy Research and Development Administration. Reactor vessel seal service fixture. 3,922,748, Cl. 15-246.500.

Riva, Mario: *See—*
Zumin, Silvia Tricerri; Riva, Mario; and Iafolla, Giuseppe, 3,923,986.

Roach, William E., to Storer Broadcasting Company. Method and apparatus for automatic program control for CATV channels. 3,924,190, Cl. 325-395.000.

Robbins Incubator Co.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Huston, Kenneth G.; Rosenberg, Bernard L.; Smith, Shirley M.; and Hausske, Gene W., deceased, 3,923,006.

Robens, Erich: *See—*
Baukal, Werner; Kinkel, Heinz-Joachim; Robens, Erich; and Walter, Gerhard, 3,923,969.

Robert Bosch G.m.b.H.: *See—*
Bosch, Paul, 3,922,856.
Scholl, Hermann, 3,923,022.
Stark, Eberhard, 3,923,021.

Roberts-Gordon Appliance Corporation: *See—*
Budden, Robert G.; and Butlak, Eugene W., 3,923,446.

Roberts, Jack E., to Fatzer, Elmer B. Trailer hitch guide. 3,924,257, Cl. 340-282.000.

Robertshaw Controls Company: *See—*
Ochsner, Rolf H., 3,924,086.
Tyler, Hugh J., 3,923,445.

Robertson, Jerry E.: *See—*
Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 3,923,810.
Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 3,923,811.

Roblin Hope's Industries, Inc.: *See—*
Sauer, Gale E., 3,922,829.

Roccaforte, Harry I., to Hoerner Waldorf Corporation. Protective carton. 3,923,235, Cl. 229-39.00B.

Rockwell International Corporation: *See—*
George, Peter K., 3,924,249.
Martin, Burton L.; and Tilly, Peter E., 3,924,216.
Moyer, James D., 3,922,886.
Spence, John R., 3,924,247.

Rocol Limited: *See—*
George, Harold M.; Hargreaves, Keith; and Wainwright, Paul, 3,923,737.

Roddy, John J.; and Higley, Alfred G., to Cushman Industries, Incorporated. Hydraulic operating mechanism for a rotary chuck. 3,922,952, Cl. 91-29.000.

Rodgers, Thomas A.: *See—*
Lewis, Robert W.; Rodgers, Thomas A.; and Goeking, Charles F., Jr., 3,923,643.

Rodgers, Thurman John, to American Microsystems, Inc. Low capacitance V groove MOS NOR gate and method of manufacture. 3,924,265, Cl. 357-23.000.

Roeder, Henning; Langner, Gunter P.; Scherhag, Bernd; Nickenig, Hans-Lothar; and Loix, Rene, to Bayer Aktiengesellschaft. Agglomerated rubber chemicals. 3,923,680, Cl. 252-182.000.

Roevens, Leopold Frans Corneel: *See—*
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willy Joannes, 3,923,808.

Rofer-DePoorter, Cheryl K.: *See—*
DePoorter, Gerald L.; and Rofer-DePoorter, Cheryl K., 3,923,619.

Rogers, Howard G.; and Norvaisa, Kestutis, to Polaroid Corporation. Method and apparatus for projecting a scene. 3,923,389, Cl. 353-38.000.

Rogers, John K., to Owens-Illinois, Inc. Galactoglucomannan boric acid complex. 3,923,781, Cl. 260-209.00R.

Rohm GmbH: *See—*
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, 3,923,883.

Rohm and Haas Company: *See—*
Howell, Thomas J., 3,923,749.

Rohrig, Josef; Konig, Justus; and Seidel, Gunther, to Siemens Aktiengesellschaft. Centrally controlled telecommunication exchange connection arrangement. 3,924,081, Cl. 179-18.0EB.

Rolair Systems, Inc.: *See—*
Burdick, Robert E., 3,923,165.

Roland, Max, to MDT Instrument Company. Fiber optic extra oral operatory light. 3,923,372, Cl. 350-96.00B.

Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Despot, Janko, 3,922,966.

Roldan, Cristobal Martinez; Brana, Miguel Fernandez; and Berlanga, Jose Maria Castellano, to Laboratorios Made, S.A. Method of obtaining 3,5 di-methylbenzamid substitutes. 3,923,820, Cl. 260-295.0AM.

Roldan, Jorge Del Rio: *See—*
Cahn-Hidalgo, Gerardo R. A.; Castanon-Pasquel, Emilio; and Roldan, Jorge Del Rio, 3,923,306.

Rolie, Gil G.: *See—*
Miller, Donald J.; and Rolie, Gil G., 3,923,196.

Rose, David; and Lepper, Herbert, to Henkel & Cie G.m.b.H. Process for producing alkadienol esters. 3,923,875, Cl. 260-497.00A.

Roselius, Wilhelm; Vitzthum, Otto; and Hubert, Peter, to Studiengesellschaft Kohle m.b.H. Methods of producing cocoa butter. 3,923,847, Cl. 260-412.800.

Rosen, Harold, to Sanders Associates, Inc. Electrical connector and circuit board mounting system. 3,923,361, Cl. 339-47.00R.

Rosenberg, Bernard L.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Huston, Kenneth G.; Rosenberg, Bernard L.; Smith, Shirley M.; and Hausske, Gene W., deceased, 3,923,006.

Rosenblatt, Joel H. Hyperbolic tower structure. 3,922,827, Cl. 52-245.000.

Rosenthal, Erich. Apparatus for the controlled feeding of lubricants and coolants to rotating surfaces in contact. 3,923,125, Cl. 184-6.000.

Rosenthale, Marvin E.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; Bell, Stanley C.; and Rosenthale, Marvin E., 3,923,991.

Roser, Kenneth F. Combined septic tank inlet pipe sight glass end plug and tank aerator system. 3,923,657, Cl. 210-95.000.

Ross, Irving D., Jr., to Youngstown Steel Door Co., The. Sealing cam interlock. 3,923,327, Cl. 292-39.000.

Ross, James: *See—*
Frant, Martin S.; Ross, James; and Riseman, John H., 3,923,608.

Rossignol, Jacques. Tool for hygiene and care of the cavities of the body. 3,923,061, Cl. 128-269.000.

Roszyk, Leon M.: *See—*
Craft, Lewis John; Roszyk, Leon M.; Stipanuk, John M.; and Szymczak, Eugene B., 3,924,169.

Rota, James E., to Ergonamic Environments, Inc. Workspace structure. 3,922,788, Cl. 32-22.000.

Roth, Donald J., to Continental Can Company, Inc. Plastic containers having improved physical properties fabricated from a composite billet. 3,923,190, Cl. 220-67.000.

Roth, Robert D.: *See—*
Schaedler, Raymond J.; and Roth, Robert D., 3,923,429.

Roth, Thomas P. Disposable sampler. 3,922,905, Cl. 73-28.000.

Rougon, Maurice Pierre Constant; and Davy, Gerald Albert Edmond, to Compagnie Honeywell Bull. Multilayer electrical connection panel with modifiable internal circuits. 3,923,360, Cl. 339-17.00R.

Rousseau, Denis Lawrence: *See—*
Feldman, Martin; Rousseau, Denis Lawrence; Sinclair, William Robert; and Weick, Walter Werner, 3,924,093.

Roussel-UCLAF: *See—*
Derible, Pierre Henri; Lavaux, Jean-Paul; and Laurent, Jacques, 3,923,800.
Marechal, Jacques Prost; and Tomasik, Georges, 3,923,985.

Roux, Remy: *See—*
Lamand, Michel; Lab nee Astier, Claudine; Roux, Remy; and Chagnaud, Paul, 3,923,982.

Roy, Alexander Rose; and Van Schalkwyk, Johannes Daniel. Method of producing coated abrasive particles. 3,923,476, Cl. 51-295.000.

Roy, Siegfried S., to Continental Can Company, Inc. Runner manifold for injection molding machine. 3,923,209, Cl. 222-478.000.

Rozsa, George: *See—*
Kober, Ehrenfried H.; Rozsa, George; and Schnabel, Wilhelm J., 3,923,732.

Ruderer, Clifford G., to Ferro Corporation. Direct-on ceramic coating of carbon-rich iron. 3,923,611, Cl. 204-35.00R.

Ruel E. Taylor, Inc.: *See—*
Taylor, Ruel E.; and Wormwood, Alston R., 3,923,299.

Ruetman, Sven H., to Dow Chemical Company, The. Vapor phase chlorination of acetonitrile in the presence of water. 3,923,860, Cl. 260-465.700.

Ruhmann, Bernhard: *See—*
Bauer, Andreas; and Ruhmann, Bernhard, 3,923,321.

Runft, Arthur J., to Kelley Company, Inc. Control switching for automatic load operators. 3,922,814, Cl. 49-28.000.

Rusch, Allan C.; and Bubak, John, to Massey-Ferguson, Inc. Control for hydrostatic transmission and brake. 3,923,129, Cl. 192-4.00B.

Russell, Jack A.; Pratt, Goodrich B.; and Gretzky, Anthony J., to Brunswick Corporation. Rotary drive element with optical sensor. 3,924,122, Cl. 250-236.000.

Russell, James E.: *See—*
Lacy, Robert H.; and Russell, James E., 3,924,226.

Rutherford, Kenneth G.; and Howick, Stanley Oriel, to Howick Chemical. Cleaning composition for inks, pencils and various soils. 3,923,701, Cl. 252-544.000.

Ruti-Te Strake B.V.: *See—*
Kaalverink, Gerardus Hendrikus, 3,923,262.

Ryan, Philip M.: *See—*
Gill, Charles D.; and Ryan, Philip M., 3,924,113.

Ryder, Albert; Dion, Henry W.; Woo, Peter W.; and Howells, John D., to Parke, Davis & Company. (R)-3-(2-deoxy-β-D-erythropentofuranosyl)-3,6,7,8-tetrahydroimidazo[4,5-d][1,3]diazepin-8-ol. 3,923,785, Cl. 260-211.50R.

Ryndin, Nikolai Ivanovich: *See—*
Snitko, Nikolai Konstantinovich; Ryndin, Nikolai Ivanovich; Yanson, Alexei Alexeevich; Vovk, Inna Ivanovna; Shvarts, Samuil Noevich; and Pavlov, Arseny Mikhailovich, 3,922,906.

Rysti, Alpo. Method and apparatus for dosage of sawn timber. 3,923,142, Cl. 198-25.000.

Saad, Michel H. Picture frame. 3,922,806, Cl. 40-152.000.

Sabel, Alex: *See—*
Goetze, Ulrich; Wole, Axel; Nettesheim, Gottfried; Balwe, Thomas; Bauer, Johann; Fendel, Kurt; Kurz, Dieter; and Sabel, Alex, 3,923,765.

Sachs-Systemtechnik GmbH: *See—*
Eibl, Volker; and Reis, August, 3,923,632.

Sadler, Francis Antony Dawson, to Girling Limited. Tandem master cylinders for hydraulic braking systems. 3,922,858, Cl. 60-562.000.

Saffren, Melvin M.: *See—*
United States of America, National Aeronautics and Space Administration; Saffren, Melvin M.; and Elleman, Daniel D., 3,924,176.

Sainsbury-Carter, John Barry: *See—*
Ianniello, Daniel John; Faiz, Robert Lee; and Sainsbury-Carter, John Barry, 3,923,422.

St. Amand, Elmer F.; and Thornbury, Thomas R., to American Hospital Supply Corporation. Threaded closure system for medical liquid container. 3,923,062, Cl. 128-272.000.

Saintours-Payerne, Bruno M.: *See—*
Mechulam, Andre; Saintours-Payerne, Bruno M.; Gay-Chatain, Guillaume A.; and Montjallard, Paul R., 3,922,949.

Saito, Kazuhiko: *See—*
Ogasawara, Masafumi; Akita, Masanori; Saito, Kazuhiko; Kikuchi, Yoshikazu; and Shiokawa, Mitsuhiro, 3,924,045.

Saito, Toranosuke; Kohno, Jujiro; Tanaka, Daiichiro; and Oda, Shinichi, to Sanko Chemical Company Ltd.; and Kanzaki Paper Manufacturing Company Ltd. Process for the production of sensitized sheet material. 3,924,027, Cl. 427-147.000.

Sakai, Heiichi: *See—*
Imanaka, Hiroshi; Kamiya, Takashi; Maeno, Shizuo; Miyoshi, Toshio; Miyairi, Norimasa; Aoki, Hatsuo; Kohsaka, Masanobu; Komori, Tadaaki; and Sakai, Heiichi, 3,923,790.

Sakai, Hideo. The path of a vehicle method and apparatus for recording. 3,924,107, Cl. 235-150.200.

Sakai, Hiroshi; Takeuchi, Fumio; and Hanake, Tsutomu, to Nippon Oils and Fats Company Limited. Sensitized slurry explosive composition. 3,923,565, Cl. 149-60.000.

Sakai, Tamiharu: *See—*
Inoue, Kimio; Hirano, Seiichi; Sakai, Tamiharu; and Ikuno, Yasokazu, 3,923,450.

Sakai, Toshimitsu; and Kawai, Mitsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Controls for automatic transmissions. 3,922,933, Cl. 74-866.000.

Sakai, Toshiyuki; Miyazaki, Kazuhide; and Abe, Kiyomi, to Mitsui Mining & Smelting Co., Ltd. Catalyst for reducing nitrogen oxides contained in combustion exhaust gas, and process for preparing same. 3,923,693, Cl. 252-459.000.

Sakamoto, Motoyoshi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 3,922,844, Cl. 58-23.00R.

Sakharov, Boris Alexandrovich: *See—*
Bulantsev, Anatoly Andreevich; Galperin, Alexandr Lvovich; Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; and Sakharov, Boris Alexandrovich, 3,923,083.

Sakuraba, Mitsuru: *See—*
Iwashita, Yuji; and Sakuraba, Mitsuru, 3,923,751.

Sakurai, Waichi; and Yoshie, Sadanobu, to Daiwa Boseki Kabushiki Kaisha; and Kabushiki Kaisha Toyota Jidoshokki Seisakusho. Device for preventing accumulation of fibers in a spinning machine. 3,922,839, Cl. 57-58.950.

Sakurai, Waichi; Sato, Katsunori; Miyagawa, Tomoyuki; and Takahashi, Hisateru, to Daiwa Boseki Kabushiki Kaisha; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for doffing without interrupting spinning operation in an open end spinning machine. 3,923,260, Cl. 242-18.00A.

Salyer, Ival O.; Wilken, Philip H.; and Ball, George L., III, to Monsanto Research Corporation. Transparent adhesive. 3,923,757, Cl. 260-80.750.

Salzman, Gary C.; Coulter, James R.; Mullaney, Paul F.; and Hiebert, Richard D., to United States of America, Energy Research and Development Administration. Potential sensing cell analyzer. 3,924,180, Cl. 324-71.0CP.

Sam P. Wallace Company, Inc.: *See—*
Brewer, Jack J., 3,923,163.

Samour, Carlos M., to Kendall Company, The. Anticonvulsant compositions containing diphenylhydantoin compounds and method of using same. 3,923,995, Cl. 424-273.000.

Sanchez, Gil C. Illuminated yo-yo. 3,924,114, Cl. 240-6.40R.

Sandbank, Carl Peter: *See—*
Earp, Charles William; Sandbank, Carl Peter; Overbury, Frances Giles; Barton, Paul; and Blair, Peter Kenneth, 3,924,236.

Sanders Associates, Inc.: *See—*
Rosen, Harold, 3,923,361.

Sanders, David E.: *See—*
Gordy, Robert S.; Sanders, David E.; and Anderson, Alfred T., 3,924,186.

Sanderson, Martin I. Fruit press. 3,922,963, Cl. 100-118.000.

Sandoz Inc.: *See—*
Anderson, Paul L., 3,923,989.
Hardtmann, Goetz E., 3,923,996.
Ho, Robert S.; Houlihan, William J.; and Nadelson, Jeffrey, 3,924,003.

Sandy, Charles A., to Du Pont de Nemours, E. I., and Company. Carbon residue inhibitor for distillate fuels. 3,923,473, Cl. 44-62.000.

Sangamo Electric Company: *See—*
Dyer, Robert E., 3,924,224.

Sanko Chemical Company Ltd.: *See—*
Saito, Toranosuke; Kohno, Jujiro; Tanaka, Daiichiro; and Oda, Shinichi, 3,924,027.

Sanko Kinzoku Kogyo Kabushiki Kaisha: *See—*
Izawa, Hisao; and Takemori, Hiroshi, 3,922,824.

Santa Fe International Corporation: *See—*
Recalde, Carlos Eduardo, 3,922,870.

Santilli, Arthur A.; and Scotese, Anthony C., to American Home Products Corporation. (8-Substituted-9-oxoxanthen-3-yloxy) acetamidoximes and nitriles for their preparation. 3,923,831, Cl. 260-335.000.

Santilli, Arthur A.; Scotese, Anthony C.; Bell, Stanley C.; and Rosenthale, Marvin E., to American Home Products Corporation. 1,6-Bis(2-piperidinoethoxy)xanthene-9-one HCl, hydrate in the treatment of inflammation. 3,923,991, Cl. 424-267.000.

Sarco Company: *See—*
Hilmer, Milton; Ritter, John W.; and Jiandani, Niranjan, 3,923,483.

Sarkes Tarzian, Inc.: *See—*
Valdettaro, Alarico A., 3,924,209.

Sarrell, Ivan D., to Koehring Company. Boom length sensing system with two-block condition sensing. 3,922,789, Cl. 33-125.00R.

Sartopi, Rolland: *See—*
Hautemont, Jean-Claude; and Sartopi, Rolland, 3,922,938.

Sasajima, Kikuo: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,923,794.

Sasaki, Koichi: *See—*
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Sasaki, Yukio: *See—*
Yonemitsu, Eiichi; Miyamori, Hiroshi; Takeda, Mutsuhiko; and Sasaki, Yukio, 3,923,884.

Sato, Katsunori: *See—*
Sakurai, Waichi; Sato, Katsunori; Miyagawa, Tomoyuki; and Takahashi, Hisateru, 3,923,260.

Sato, Koichi: *See—*
Furuse, Takashi; Kamata, Sachio; Sekine, Kunio; and Sato, Koichi, 3,923,094.
Hirano, Tadayo; and Sato, Koichi, 3,923,160.

Sauer, Gale E., to Roblin Hope's Industries, Inc. Locking connection for supporting grid systems. 3,922,829, Cl. 52-667.000.

Sausse, Andre: *See—*
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Sawa, Yoichi; Hattori, Toshinori; Katsube, Susumu; and Goto, Akitoshio, to Takeda Chemical Industries. Process for producing indan derivatives. 3,923,866, Cl. 260-469.000.

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Scaglione, Paul J. Fluid flow control valve. 3,923,077, Cl. 137-546.000.

Scarpellino, Richard John: *See—*
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Schaar, Charles H., to Kendall Company, The. Expandable splint. 3,923,048, Cl. 128-87.00R.

Schaedler, Raymond J.; and Roth, Robert D., to Chicago Pneumatic Tool Company. Overspeed safety device for rotary tools. 3,923,429, Cl. 418-43.000.

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Schemmel, Hans Robert, to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH. Modulator circuits for translating D.C. signals into synchronous A.C. singals. 3,924,203, Cl. 332-9.00R.

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Schips, Helmut; and Kernbichler, Rolf, to Schips, Helmut. Device for automatic cutting of thread in sewing machines. 3,922,983, Cl. 112-252.000.

Schlaepfer, Hans: *See—*
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Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, to BASF Aktiengesellschaft. Process for stabilizing polyamides. 3,923,735, Cl. 260-45.85R.

Schlienger, Inc.: *See—*
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Schlienger, Max P., to Schlienger, Inc. Apparatus and method for cleaning and sealing of bottom pour crucible. 3,924,053, Cl. 13-33.000.

Schloemann-Siemag Aktiengesellschaft: *See—*
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Schmidt, Hans; and Strabberger, Werner, to Hoechst Aktiengesellschaft. Process for preparing high molecular weight aliphatic carboxylic acids by chromosulfuric acid oxidation of α-olefins. 3,923,848, Cl. 260-413.000.

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Schneider, Karl-Heinz: *See—*
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Schneider, Kurt; Fahnler, Friedrich; Dhein, Rolf; and Heydenreich, Frieder, to Bayer Aktiengesellschaft. Process for the preparation of polyamides with increase impact strength. 3,923,925, Cl. 260-857.0PG.

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Scholz, Donald T., to Polaroid Corporation. Multipurpose audio-visual cassette system. 3,923,386, Cl. 352-72.000.

Schrock, Wilfried; Metzger, Karl-Georg; and Konig, Hans-Bodo, to Bayer Aktiengesellschaft. Penicillins. 3,923,789, Cl. 260-239.100.

Schroder, Heinz-Jurgen, to Siemens Aktiengesellschaft. Emergency water cooling system for a steam generator for a pressurized-water coolant nuclear reactor. 3,923,007, Cl. 122-32.000.

Schroeder, Guenter: *See—*
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Schroter, Carl; and Mulfinger, Eckhard, to Hermann, Heinrich. Labelling apparatus for printing dispensing and affixing of labels. 3,923,582, Cl. 156-368.000.

Schubert, Bernard, to Hauni-Werke Korber & Co., KG. Apparatus for transporting receptacles. 3,923,173, Cl. 214-301.000.

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Schuler, Emil H.; Schuler, Robert C.; and Lathey, Howard N., to Schuler Brothers Inc. Method and apparatus for applying jackets to covers of books or the like. 3,922,743, Cl. 11-1.00R.

Schuler, Robert C.: *See—*
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Schulte-Elte, Karl-Heinrich, to Firmenich S.A. Substituted-3-oxo-butanoyl-cyclohexenes. 3,923,896, Cl. 260-586.00R.

Schulte-Elte, Karl-Heinrich, to Firmenich S.A. Process for the oxidation of alkyl-substituted 2-cyclohexen-1-ones. 3,923,898, Cl. 260-586.00P.

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Schutte, Dieter; Diether, Jean; and Brunner, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Method of modifying the surface properties of finely divided metal oxides. 3,924,029, Cl. 427-213.000.

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Scott, John J., to Norton Company. Process for the recovery of tantalum and niobium and other metals from tin slag. 3,923,497, Cl. 75-24.000.

Scott, Norman D. Flowmeter. 3,922,913, Cl. 73-219.000.

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Seilinger, Alexandre. Antiperspirant and deodorant composition containing lamellar substances. 3,923,971, Cl. 424-65.000.

Seitz, Helmut, to Franz Morat GmbH, Firma. System for the electronic control of textile machines or for the manufacture of control strips for textile machines. 3,924,244, Cl. 340-172.500.

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Semeia, Roberto, to AMF Mares Sub S.p.A. Composite swim fins. 3,922,741, Cl. 9-309.000.

Semple, Alexander MacGregor, to Ranco Incorporated. Thermostat. 3,924,213, Cl. 337-130.000.

Senolt, Hans; Tomaschko, Heinrich; and Palvik, Georg, to Osterreichische Mineralolverwaltung Aktiengesellschaft. Bitumen blowing. 3,923,633, Cl. 208-6.000.

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Shaffer, John W., to GTE Sylvania Incorporated. Moisture indicator for photoflash lamp. 3,923,684, Cl. 252-408.000.

Shaffer, Peter T. B., to Carborundum Company, The. Electrolytic cell for inactivation and destruction of pathogenic material. 3,923,629, Cl. 204-260.000.

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Shapiro, Jonas M.; and Zetena, Maurice, to Executone, Inc. Shielded flexible conductor cable and assembly thereof. 3,923,364, Cl. 339-176.0MF.

Shapiro, Stanley; and Caron, Ronald N., to Olin Corporation. Processing copper base alloys. 3,923,555, Cl. 148-11.50A.

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Shirai, Isoo; Suzuki, Takeshi; and Tonooka, Koichi, to Chisso Corporation. Process for activating catalyst component useful for polymerizing propylene. 3,923,687, Cl. 252-429.00C.

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Shock, D'Arcy A.; and Radd, Fred J., to Continental Oil Company. Method of storing heavy hydrocarbon materials in subterranean facilities. 3,922,863, Cl. 61-.500.

Shockovsky, Michael Joseph. Golf glove. 3,922,724, Cl. 2-161.00A.

Shoji, Jun'ichi; Mayama, Mikao; Matsuura, Shinzo; Matsumoto, Kouichi; and Wakisaka, Yoshiharu, to Shionogi & Company, Ltd. Antibiotic 60-6 and production thereof. 3,923,979, Cl. 424-118.000.

Shore, Frank. Multi-utility durable mitered picture frame. 3,922,807, Cl. 40-152.100.

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Silvestri, Anthony J.; and Naro, Paul A., to Mobil Oil Corporation. Liquefaction of coal. 3,923,634, Cl. 208-10.000.

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Simons, Carel Arthur Jan, to U.S. Philips Corporation. Variable optical wedge for scanning a light beam in an apparatus for reading an optically encoded disc. 3,924,063, Cl. 178-6.60R.

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Sitek, George J.; and Revesz, Robert N., to Leco Corporation. Combustion apparatus for analytical instruments. 3,923,464, Cl. 23-253.0PC.

Sitzmann, Michael E.; and Dacons, Joseph C., to United States of America, Navy. Nitro-pyrimidines. 3,923,804, Cl. 260-251.00R.

Sitzmann, Michael E.; and Dacons, Joseph C., to United States of America, Navy. 2,5-Dipicryl thiophenes. 3,923,830, Cl. 260-329.00R.

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Johansson, Karl Olof; Nilsson, Alvar Erling; and Skarfelt, Hans TorBjorn, 3,923,187.

Skinner, James R.; Uitz, Mark O.; and Hait, Paul W., to F. J. L. Corporation. Motion picture viewer with removable cartridge. 3,923,387, Cl. 352-78.00R.

Slater, Charles A., Jr., to Peterson Manufacturing Company. Compression coupling. 3,923,325, Cl. 285-312.000.

Slocum, Charles W., to Thermo-Electronics, Inc. Resistance devices for use in energizing the starting winding of a split phase induction motor. 3,924,222, Cl 338-220.000.

Smeby, Robert Rudolph: *See—*
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,923,769.
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,923,770.
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,923,771.

Smith, Ernest L., to Phillips Petroleum Company. Container and paperboard blanks for forming same. 3,923,233, Cl. 229-5.500.

Smith, Hubert Stacy, Jr., to Dow Chemical Company, The. Cryogenic construction and article therefor. 3,924,039, Cl. 428-119.000.

Smith, John Joseph, to Stahl-Urban Company. Folding apparatus for a sewing machine. 3,922,978, Cl. 112-147.000.

Smith, John R.; and Bray, James A., to National Steel Corporation. Lubricated metallic container stocks and method of preparing the same and applying an organic coating thereto. 3,923,471, Cl. 29-195.000.

Smith, Percy L.: *See—*
Atkins, Kenneth E.; Harpold, Michael A.; and Smith, Percy L., 3,923,928.

Smith, Schuyler B., to Dow Corning Corporation. Method of preparing fire retardant siloxane foams and foams prepared therefrom. 3,923,705, Cl. 260-2.50S.

Smith, Shirley M.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Huston, Kenneth G.; Rosenberg, Bernard L.; Smith, Shirley M.; and Hausske, Gene W., deceased, 3,923,006.

Smith, Stanley W.: *See—*
Katz, Murray; Smith, Stanley W.; and Reitsma, David, 3,923,546.

Smith, William E., to General Electric Company. Process for making 4-butyrolactone. 3,923,835, Cl. 260-343.600.

Smithgall, David Harry, Sr.: *See—*
Dabby, Franklin Winston; and Smithgall, David Harry, Sr., 3,923,373.

SmithKline Corporation: *See—*
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DeMarinis, Robert M.; and Hoover, John R. E., 3,923,799.
Loev, Bernard, 3,923,809.
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Nuijens, Hubertus Ludovicus Cornelius; Doedee, Robert Theodorus Maria; and Snethorst, Adrianus Cornelis Josephus Maria, 3,923,547.

Snitko, Nikolai Konstantinovich; Ryndin, Nikolai Ivanovich; Yanson, Alexei Alexeevich; Vovk, Inna Ivanovna; Shvarts, Samuil Nozvich; and Pavlov, Arseny Mikhailovich. Method of locating the center of gravity etc. 3,922,906, Cl. 73-65.000.

Societe Anonyme Ato Chimie: *See—*
Fassy, Henri; Lalet, Philippe; and Miletto, Andre, 3,923,764.

Societe Anonyme: Poclain: *See—*
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Jankowiak, Christian S., 3,923,172.

Societe Anonyme Societe Nouvelle Baele Gangloff: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Bosund, Sven Ingmar Walton; and Bengtsson, Bengt Lennart, 3,924,005.

Societe d'Optique, Precision Electronique et Mechanique — Sopelem: *See—*
Llop, Helenio; and Lefort, Pierre, 3,923,401.

Societe Europeenne d'Isolateurs en Verre (SEDIVER): *See—*
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Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM): *See—*
Condolios, Elie; and Merle, Michel, 3,923,652.

Societe Lignes Telegraphiques et Telephoniques: *See—*
Fache, Michel; Blondel, Jacques; and Mahieu, Jean-Rene, 3,924,204.

Societe Nationale Industrielle Aerospatiale: *See—*
Fremont, Maurice, Henri, Louis; Denis, Jean-Francois; and Dzalba-Lyndis, Serve, Yvan, 3,922,899.

Societe Technique de Pulverisation: *See—*
Boris, Michel, 3,923,250.

Soffra Etablissement: *See—*
Piccioli, Dino; and Schmid, Christian, 3,923,937.

Sohma, Akio, to Hitachi, Ltd. Moisture separating and steam reheating apparatus. 3,923,009, Cl. 122-34.000.

Soichet, Samuel. Inflatable intrauterine contraceptive device for postpartum use. 3,923,051, Cl. 128-130.000.

Sokolovsky, Mordechai; and Maayani, Saul. Phenycyclidine for inducing mydriasis in humans. 3,923,990, Cl. 424-267.000.

Solter, Robert L.; and Hansen, Franklin A., to Continental Disc Corporation. Method for producing pre-mounted rupture discs. 3,922,767, Cl. 29-157.00R.

Song, John; and Richmond, Henry, to American Cyanamid Company. 4-Alkyl-2,6-dimethyl-3-hydroxybenzyl esters of 3,3'-dipropionic acid. 3,923,869, Cl. 260-481.00R.

Sony Corporation: *See—*
Nakajima, Heitaro; Kawakami, Hirotake; Tatara, Shokichi; and Kishigami, Jun, 3,923,309.

Sorenson, Marius Walter; Whiteside, Ross Clinton, Jr.; and Hickner, Richard Allan, to Dow Chemical Company, The. Polyols containing ketal groups and polyurethanes prepared therefrom. 3,923,744, Cl. 260-77.5AP.

Sosinski, Charles W., to Thomas & Betts Corporation. Butt-type compression connector. 3,924,057, Cl. 174-94.00R.

Southwire Company: *See—*
Carden, Danny P., 3,923,003.

Sovia, Cedric C.; and Krengel, Kenneth W. Windshield for snow vehicle. 3,923,338, Cl. 296-84.00K.

Sparham, Vaughan R.; and Bixby, Leon C., to Hendrick Manufacturing Company. Floating clarifier mechanism and method. 3,923,649, Cl. 210-20.000.

Spector, George: *See—*
Goldberg, Libby M.; and Spector, George, 3,924,009.

Spector, Richard; and Stretanski, Joseph Anthony, to American Cyanamid Company. Polyolefin light stabilizers. 3,923,733, Cl. 260-45.8NE.

Spence, John R., to Rockwell International Corporation. Driver cell with memory and shift capability. 3,924,247, Cl. 340-173.0CA.

Sperry Rand Corporation: *See—*
Cunningham, James M.; Dorn, Kenneth A.; Howe, James A.; and Mortenson, Charles L., 3,924,143.
Farrell, Robert G., 3,923,075.
Kline, Charles M.; Priepke, Edward H.; Waldrop, Thomas W.; Fisher, Raymond E.; Greiner, James G.; and McCarty, Horace G., 3,922,838.
Potter, Curtis N., 3,922,775.
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Spicuzza, John P., Jr.: *See—*
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Spinks, Ray E.: *See—*
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Spiwak, John J.: *See—*
Toeniskoetter, Richard H.; and Spiwak, John J., 3,923,525.

Spohn, Daniel M., Jr. Adjustable radial arm apparatus for use with a router or the like. 3,923,086, Cl. 144-134.00B.

Spokas, John J., to United States of America, Energy Research and Development Administration. Vibrating fiber electrometer. 3,924,184, Cl. 324-99.00R.

Sprecher & Schuch AG: *See—*
Heutschi, Hans; and Krebs, Peter, 3,924,088.

Spreen, Fred John, to Lawrence Peska Associates, Inc., a part interest. Retractable pouring spout. 3,923,211, Cl. 222-528.000.

Spry, Douglas O., to Eli Lilly and Company. 2-Alkoxycephalosporins. 3,923,795, Cl. 260-243.00C.

Staal, Gerardus B.: *See—*
Henrick, Clive A.; and Staal, Gerardus B., 3,923,871.
Staas, Frans Adrianus; and Severijns, Adrianus Petrus, to U.S. Philips Corporation. Helium 3-helium 4 dilution refrigerator. 3,922,881, Cl. 62-502.000.
Stackpole Components Company: *See—*
Abernethy, Lynn W., 3,924,089.
Stadhouders, Jacobus J.: *See—*
Driessen, Fransiscus M.; Stadhouders, Jacobus J.; and Ubbels, Jacob, 3,924,007.
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Stahl-Urban Company: *See—*
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Standard Oil Company: *See—*
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Fenoglio, David J., 3,923,753.
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Stanley-Mabo: *See—*
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Staples, Jon T., to Eastman Kodak Company. Process for producing color images by bleaching redox diffusible dye releasers. 3,923,510, Cl. 96-20.000.
Stark, Eberhard, to Robert Bosch G.m.b.H. Digital circuit providing a trigger signal to trigger an event based on operating functions of moving apparatus elements, particularly to trigger an ignition pulse in an internal combustion engine. 3,923,021, Cl. 123-117.00R.
Stark, William Max: *See—*
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Starner, Eugene R.: *See—*
United States of America, National Aeronautics and Space Administration; Nossen, Edward J.; and Starner, Eugene R., 3,924,183.
Stasz, Peter; and Cosentino, Louis C., to Medtronic, Inc. Cardiac signal augmentation apparatus. 3,923,041, Cl. 128-2.06R.
Stauffer Chemical Company: *See—*
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Stearns, George H., to Mill Supply, Inc. Material handling apparatus for hogged fuel. 3,923,149, Cl. 198-106.000.
Stearns, Richard S.; Duling, Irl N.; and Gates, David S., to Sun Ventures, Inc. Ethylene-propylene copolymer oil. 3,923,919, Cl. 260-683.100.
Steele, Joseph W., to United States of America, Navy. Porpoise stranding device. 3,922,812, Cl. 43-100.000.
Steidley, Roy B.: *See—*
Choksi, Pradip V.; and Steidley, Roy B., 3,923,179.
Choksi, Pradip V.; and Steidley, Roy B., 3,923,183.
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Stem Industries, Inc.: *See—*
Markowitz, Isral J., 3,923,018.
Stemsrud, Finn; Ullevalseter, Reidar Otto; and Mengkrog, Oystein, to Norges Landbrukshogskole. Method and apparatus for measuring and recording the tension and rigidity of a ski under stress. 3,922,908, Cl. 73-100.000.
Stenzel, Wallace I.; Kufrin, Frederick W.; and Allen, Donald J., to Waukee Engineering Co. Firecheck. 3,923,475, Cl. 48-192.000.
Stephanoff, Nicholas N., to Fluid Energy Processing & Equipment Co. Drying mill for wet granular material. 3,922,796, Cl. 34-10.000.
Stephens, Donald K.: *See—*
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Sterling Drug Inc.: *See—*
Andrews, Roderic Stafford; Barlow, Christoper George; and Livingstone, John Lewis, 3,923,974.
Stevenson, Fred: *See—*
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Stewart, Sherman A., to Grefco, Inc. Spraying nozzle. 3,923,253, Cl. 239-463.000.
Stichting Bedrijven Van Het Nederlands Instituut Voor Zuivelonderzoek: *See—*
Driessen, Fransiscus M.; Stadhouders, Jacobus J.; and Ubbels, Jacob, 3,924,007.
Stickler, Ray E.; and Hicks, Glenn W. Faucet valve. 3,923,284, Cl. 251-172.000.
Stine, Laurence O.; and Conner, Algie J., to Universal Oil Products Company. Fluidized catalyst regeneration by oxidation in a dense phase bed and a dilute phase transport riser. 3,923,686, Cl. 252-417.000.
Stipanuk, John M.: *See—*
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Stockhaus, Klaus: *See—*
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Stocklin, Helmut; and Keck, Werner, to Dornier GmbH. Device for centering and arresting an aircraft positioned on a take-off and landing platform and starting therefrom and landing thereon. 3,923,274, Cl. 244-115.000.
Stoddard, William H., Jr.: *See—*
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Stoeckelmann, Guenter: *See—*
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Stohr, Arno. Apparatus for the production of thermoplastic articles with burdock-like hooks. 3,923,442, Cl. 425-309.000.
Stolka, Milan; Pearson, James M.; and Yanus, John F., to Xerox Corporation. Process for preparation of 2-anthryl and substituted 2-anthryl functional monomers and polymers. 3,923,762, Cl. 260-89.500.
Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,924,015.
Stolov, Michael. Digital display device. 3,924,227, Cl. 340-336.000.
Stone, Aidan M., to General Electric Company. Safety-start device and circuit controller for domestic appliance. 3,924,085, Cl. 200-61.620.
Stone, Herman: *See—*
O'Brien, John B.; and Stone, Herman, 3,923,491.
Stoner, Jacob G., to General Motors Corporation. Adjustable coupling clamp assembly. 3,923,409, Cl. 403-290.000.
Stonov, Leonid Dmitrievich: *See—*
Melnikov, Nikolai Nikolaevich; Grapov, Artur Felixovich; Kozlova, Tamara Fedorovna; Shakhova, Galina Borisovna; Pokatun, Valery Pavlovich; Stonov, Leonid Dmitrievich; Bakumenko, Ljudmila Alexandrovna; Sergeeva, Tatyana Akimovna; and Titova, Lidia Mikhailovna, 3,923,493.
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Stragier, Marcel G. Non-stop refuse collection container. 3,923,174, Cl. 214-313.000.
Strauff, Gunther, to Langen & Co. System for limiting the force of reaction in hydraulic servo-control devices. 3,922,953, Cl. 91-371.000.
Strejcek, Jan: *See—*
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Wiltshire, Arthur J., 3,922,820.
Strunk, Fred E. Bleeder valve cleaner. 3,922,746, Cl. 15-104.10R.
Studenroth, Karl E. Chambered piston for an internal combustion engine. 3,923,032, Cl. 123-193.00P.
Studiengesellschaft Kohle m.b.H.: *See—*
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Stuetz, Dagobert Englebert: *See—*
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Sturgeon, Hulan D., to Lawrence Peska Associates, Inc., a part interest. Auto desk. 3,922,973, Cl. 108-26.000.
Sturwold, Robert J.; Barrett, Fred O.; and Utz, Walter E., to Emery Industries, Inc. Conversion of distillation residues to useful metal working lubricants. 3,923,702, Cl. 252-56.00S.
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, to Sumitomo Chemical Company, Limited. Process for the preparation of hydroquinone and/or resorcinol by the cleavage of dihydroperoxides. 3,923,908, Cl. 260-621.00C.
Suga, Michio: *See—*
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Suga, Shigeru. Arc lamp for a weathermeter and provided with magnet means. 3,924,118, Cl. 240-11.20A.
Suggitt, Robert M.: *See—*
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Sugioka, Isao: *See—*
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Sullivan, Donald K.: *See—*
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Sullivan, T. M.: *See—*
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Sullivan, Wayne S. Method for making artificial stone. 3,924,037, Cl. 428-15.000.

Sumida, Carl: *See—*
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Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,923,710.
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Sumitomo Electric Industries, Ltd.: *See—*
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Sumoto, Misao: *See—*
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Sun Oil Company of Pennsylvania: *See—*
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Sun Ventures, Inc.: *See—*
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Sunbeam Corporation: *See—*
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Sundstrom, John A., Jr., to General Motors Corporation. Clothes washer suspension system. 3,922,891, Cl. 68-23.300.

Suno, Masahiro: *See—*
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Sunstar Chemical Industry Co., Ltd.: *See—*
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Susko, James Alan, to Cooper Tire & Rubber Company. Slide projection apparatus. 3,923,390, Cl. 353-95.000.

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Suzuki, Haruyoshi; Takino, Thuyoshi; Mori, Naomichi; Sugioka, Isao; Matsuda, Osamu; Sekino, Shozo; and Honma, Hiroyuki, to Nippon Steel Corporation; and Nippon Steel Welding Products Engineering Co., Ltd. Welding method and materials. 3,924,091, Cl. 219-73.000.

Suzuki, Masatosi: *See—*
Kamigaito, Osami; Masaki, Hideyuki; Oki, Masami; Suzuki, Masatosi; and Nakamura, Yasuo, 3,923,698.

Suzuki, Shigeo, to TDK Electronic Company. Golf ball position mark assembly. 3,923,215, Cl. 224-5.00C.

Suzuki, Takeshi: *See—*
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Suzuki, Yasuo, to Kabushiki Kaisha Komatsu Seisakusho. Sound arresting device in a vehicle for use in construction work. 3,923,114, Cl. 180-54.00A.

Suzuki, Yoshi: *See—*
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Svarz, Jerry J., to Nalco Chemical Company. Thin film catalytic polymerization of water-in-oil emulsions of water-soluble ethylenically unsaturated amide monomers. 3,923,756, Cl. 260-80.30N.

Svensson, Sven Erik: *See—*
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Swietek, Donald J.: *See—*
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Sybron Corporation: *See—*
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Sylvania Electric Products, Inc.: *See—*
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Synergex Corporation: *See—*
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Synnatschke, Gotthard; Gueckel, Walter; and Rittig, Falk, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Insecticidal compositions. 3,923,999, Cl. 424-300.000.

Syntex Corporation: *See—*
Chang, Kuang Y.; and Ferrell, Bonnie, 3,924,004.

Szymczak, Eugene B.: *See—*
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Tabata, Hisanobu; and Tabata, Norimasa. Process for pretreating sea water by preheating same in the preparation of brine and fresh water. 3,923,607, Cl. 203-7.000.

Tabata, Norimasa: *See—*
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Tachibana, Kan-ichi; Nishioka, Michihiro; and Ono, Mikiya, to Mitsubishi Mining & Cement Company Ltd. Small size DC motors. 3,924,148, Cl. 310-220.000.

Tacke, Peter: *See—*
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Takagi, Kunihiko: *See—*
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Takahashi, Hirokazu; and Kato, Masao, to Tokyo Shibaura Electric Co., Ltd. High frequency therapeutic apparatus. 3,924,196, Cl. 328-253.000.

Takahashi, Hisateru: *See—*
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Takahashi, Katsumi: *See—*
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Takahashi, Kei: *See—*
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Takahashi, Yoshihiro: *See—*
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Tanksley, Neeld D., to Pacific Pollution Control. Floating boom having rotatable float elements. 3,922,860, Cl. 61-1.00F.
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Tanus, Antonio. Theater chair automatically movable by remote control. 3,923,300, Cl. 272-18.000.
Tanzer, John J. Bottle carrier device. 3,923,155, Cl. 206-427.000.
Tarnow, Virgil K.; and Doshier, Kenneth E., to Barber-Colman Company. Brushholders and ancillary components mounted on a printed circuit board. 3,924,147, Cl. 310-68.000.
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Taylor, Ruel E.; and Wormwood, Alston R., to Ruel E. Taylor, Inc. Method and apparatus for forming an even edged pile of flexible sheets. 3,923,299, Cl. 271-221.000.
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B 266,195	3,923,599	Dec. 2, 1975	B 328,205	3,914,106	Oct. 21, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 328,210	3,914,275	Oct. 21, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 328,870	3,916,486	Nov. 4, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 329,476	3,920,562	Nov. 18, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 329,787	3,920,688	Nov. 18, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 329,816	3,923,947	Dec. 2, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 330,828	3,913,589	Oct. 21, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 331,417	3,914,157	Oct. 21, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 331,557	3,916,577	Nov. 4, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 331,895	3,916,403	Oct. 28, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 332,527	3,924,017	Dec. 2, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 333,876	3,921,208	Nov. 18, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 334,868	3,919,469	Nov. 11, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 334,985	3,923,912	Dec. 2, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 335,773	3,920,953	Nov. 18, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 336,129	3,923,606	Dec. 2, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 336,652	3,914,211	Oct. 21, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 336,902	3,918,897	Nov. 11, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 336,946	3,919,425	Nov. 11, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 336,978	3,923,968	Dec. 2, 1975
B 288,627	3,916,179	Oct. 28, 1975	B 337,235	3,919,386	Nov. 11, 1975
B 289,471	3,917,184	Nov. 4, 1975	B 337,442	3,913,658	Oct. 21, 1975
B 289,523	3,921,166	Nov. 18, 1975	B 337,703	3,914,690	Oct. 21, 1975
B 292,054	3,915,877	Oct. 28, 1975	B 337,787	3,923,506	Dec. 2, 1975
B 292,126	3,914,465	Oct. 21, 1975	B 340,212	3,922,645	Nov. 25, 1975
B 292,140	3,914,340	Oct. 21, 1975	B 341,579	3,913,363	Oct. 21, 1975
B 292,563	3,923,653	Dec. 2, 1975	B 342,886	3,923,507	Dec. 2, 1975
B 293,378	3,923,725	Dec. 2, 1975	B 343,136	3,919,453	Nov. 11, 1975
B 293,437	3,913,414	Oct. 21, 1975	B 343,506	3,916,021	Oct. 28, 1975
B 294,579	3,916,737	Nov. 4, 1975	B 343,577	3,921,165	Nov. 18, 1975
B 294,673	3,916,023	Oct. 28, 1975	B 344,479	3,924,042	Dec. 2, 1975
B 295,481	3,921,593	Nov. 25, 1975	B 345,060	3,916,018	Oct. 28, 1975
B 295,674	3,916,107	Oct. 28, 1975	B 345,384	3,916,146	Oct. 28, 1975
B 295,860	3,923,880	Dec. 2, 1975	B 345,422	3,914,392	Oct. 21, 1975
B 299,267	3,917,106	Nov. 4, 1975	B 345,567	3,913,985	Oct. 21, 1975
B 300,353	3,921,734	Nov. 25, 1975	B 346,165	3,913,293	Oct. 21, 1975
B 302,836	3,923,573	Dec. 2, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 303,702	3,914,131	Oct. 21, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 305,417	3,915,882	Oct. 28, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 305,868	3,921,463	Nov. 25, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 305,881	3,923,478	Dec. 2, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 306,938	3,916,050	Oct. 28, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 307,677	3,915,276	Oct. 28, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 308,892	3,919,624	Nov. 11, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 309,207	3,914,743	Oct. 21, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 309,499	3,922,002	Nov. 25, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 309,755	3,919,468	Nov. 11, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 309,756	3,914,136	Oct. 21, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 309,860	3,922,485	Nov. 25, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 310,271	3,923,689	Dec. 2, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 311,317	3,918,975	Nov. 11, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 312,477	3,923,714	Dec. 2, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 313,900	3,915,932	Oct. 28, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 314,049	3,920,588	Nov. 18, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 314,255	3,923,764	Dec. 2, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 314,271	3,921,845	Nov. 25, 1975	B 351,218	3,914,186	Oct. 21, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 351,222	3,921,179	Nov. 18, 1975
B 351,348	3,923,563	Dec. 2, 1975
B 351,421	3,914,733	Oct. 21, 1975
B 351,493	3,914,758	Oct. 21, 1975
B 351,535	3,915,239	Oct. 28, 1975
B 351,665	3,919,701	Nov. 11, 1975
B 351,672	3,914,000	Oct. 21, 1975
B 351,735	3,913,385	Oct. 21, 1975
B 351,863	3,914,700	Oct. 21, 1975
B 351,926	3,914,133	Oct. 21, 1975
B 351,939	3,913,480	Oct. 21, 1975
B 352,934	3,913,692	Oct. 21, 1975
B 352,950	3,922,590	Nov. 25, 1975
B 352,965	3,921,926	Nov. 25, 1975
B 353,317	3,916,446	Nov. 4, 1975
B 353,546	3,913,273	Oct. 21, 1975
B 354,296	3,914,580	Oct. 21, 1975
B 354,889	3,913,204	Oct. 21, 1975
B 354,979	3,914,251	Oct. 21, 1975
B 355,269	3,914,561	Oct. 21, 1975
B 355,510	3,913,704	Oct. 21, 1975
B 357,057	3,913,738	Oct. 21, 1975
B 357,402	3,914,180	Oct. 21, 1975
B 357,803	3,919,470	Nov. 11, 1975
B 358,244	3,913,411	Oct. 21, 1975
B 358,311	3,923,561	Dec. 2, 1975
B 359,174	3,914,117	Oct. 21, 1975
B 359,540	3,915,235	Oct. 28, 1975
B 359,825	3,921,344	Nov. 25, 1975
B 359,946	3,914,132	Oct. 21, 1975
B 359,947	3,914,653	Oct. 21, 1975
B 360,208	3,923,750	Dec. 2, 1975
B 360,296	3,916,720	Nov. 4, 1975
B 360,719	3,915,715	Oct. 28, 1975
B 361,265	3,923,569	Dec. 2, 1975
B 361,569	3,914,554	Oct. 21, 1975
B 361,604	3,922,702	Nov. 25, 1975
B 361,734	3,915,764	Oct. 28, 1975
B 362,589	3,914,012	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975
B 363,457	3,922,595	Nov. 25, 1975
B 363,892	3,913,395	Oct. 21, 1975
B 363,962	3,921,826	Nov. 25, 1975
B 364,022	3,913,499	Oct. 21, 1975
B 364,163	3,916,092	Oct. 28, 1975
B 364,241	3,916,668	Nov. 4, 1975
B 364,528	3,919,510	Nov. 11, 1975
B 364,786	3,921,673	Nov. 25, 1975
B 365,490	3,918,527	Nov. 11, 1975
B 365,834	3,914,702	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975
B 366,589	3,914,719	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975
B 367,661	3,914,158	Oct. 21, 1975
B 367,739	3,923,648	Dec. 2, 1975
B 368,392	3,913,812	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975
B 369,997	3,913,533	Oct. 21, 1975
B 371,085	3,923,783	Dec. 2, 1975
B 371,787	3,921,217	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975
B 373,326	3,920,433	Nov. 18, 1975
B 373,428	3,915,511	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975
B 375,652	3,921,303	Nov. 25, 1975
B 376,504	3,914,570	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975
B 376,799	3,913,955	Oct. 21, 1975
B 377,172	3,918,255	Nov. 11, 1975
B 377,833	3,913,884	Oct. 21, 1975
B 377,869	3,917,002	Nov. 4, 1975
B 378,621	3,923,840	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975
B 379,172	3,914,379	Oct. 21, 1975
B 379,282	3,913,462	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975
B 380,310	3,921,048	Nov. 18, 1975
B 380,312	3,913,953	Oct. 21, 1975
B 380,446	3,923,836	Dec. 2, 1975
B 380,900	3,913,307	Oct. 21, 1975
B 381,074	3,919,583	Nov. 11, 1975
B 381,632	3,914,732	Oct. 21, 1975
B 381,847	3,921,152	Nov. 18, 1975
B 382,021	3,913,212	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975
B 382,783	3,919,527	Nov. 11, 1975
B 382,840	3,922,007	Nov. 25, 1975
B 383,532	3,914,246	Oct. 21, 1975
B 384,658	3,913,452	Oct. 21, 1975
B 384,773	3,915,416	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975
B 387,687	3,918,151	Nov. 11, 1975
B 387,761	3,914,245	Oct. 21, 1975
B 387,818	3,918,935	Nov. 11, 1975
B 388,580	3,923,712	Dec. 2, 1975
B 389,070	3,914,171	Oct. 21, 1975
B 389,285	3,914,631	Oct. 21, 1975
B 389,639	3,914,626	Oct. 21, 1975
B 389,726	3,921,010	Nov. 18, 1975
B 389,807	3,922,623	Nov. 25, 1975
B 389,932	3,913,268	Oct. 21, 1975
B 389,933	3,913,267	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975
B 390,732	3,913,878	Oct. 21, 1975
B 391,184	3,914,214	Oct. 21, 1975
B 391,210	3,914,220	Oct. 21, 1975
B 391,437	3,915,416	Oct. 28, 1975
B 391,675	3,916,017	Oct. 28, 1975
B 392,154	3,923,809	Dec. 2, 1975
B 392,696	3,916,175	Oct. 28, 1975
B 392,732	3,914,903	Oct. 21, 1975
B 392,753	3,916,341	Oct. 28, 1975
B 392,894	3,914,763	Oct. 21, 1975
B 393,163	3,914,535	Oct. 21, 1975
B 393,970	3,914,638	Oct. 21, 1975
B 394,088	3,914,740	Oct. 21, 1975
B 394,300	3,914,159	Oct. 21, 1975
B 394,712	3,916,306	Oct. 28, 1975
B 395,478	3,922,577	Nov. 25, 1975
B 395,496	3,919,435	Nov. 11, 1975
B 395,671	3,920,418	Nov. 18, 1975
B 395,889	3,913,190	Oct. 21, 1975
B 396,025	3,913,869	Oct. 21, 1975
B 396,551	3,921,929	Nov. 25, 1975
B 397,027	3,923,736	Dec. 2, 1975
B 397,527	3,913,488	Oct. 21, 1975
B 397,990	3,914,848	Oct. 28, 1975
B 398,262	3,913,481	Oct. 21, 1975
B 398,597	3,913,743	Oct. 21, 1975
B 398,625	3,920,996	Nov. 18, 1975
B 399,292	3,914,810	Oct. 28, 1975
B 399,304	3,919,567	Nov. 11, 1975
B 399,766	3,915,667	Oct. 28, 1975
B 400,293	3,923,719	Dec. 2, 1975
B 400,310	3,915,507	Oct. 28, 1975
B 402,555	3,914,688	Oct. 21, 1975
B 403,140	3,913,486	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975
B 403,990	3,914,684	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28, 1975
B 404,437	3,915,200	Oct. 28, 1975
B 405,136	3,915,565	Oct. 28, 1975
B 405,137	3,915,566	Oct. 28, 1975
B 405,305	3,922,111	Nov. 25, 1975
B 405,360	3,913,403	Oct. 21, 1975
B 405,938	3,920,109	Nov. 18, 1975
B 406,065	3,914,199	Oct. 21, 1975
B 408,487	3,924,046	Dec. 2, 1975
B 408,749	3,914,116	Oct. 21, 1975
B 409,220	3,915,648	Oct. 28, 1975
B 409,251	3,922,620	Nov. 25, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,514	3,923,929	Dec. 2, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 421,026	3,914,785	Oct. 21, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 422,949	3,921,873	Nov. 25, 1975	B 437,450	3,922,479	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 424,462	3,920,522	Nov. 18, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 425,035	3,914,025	Oct. 21, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 425,345	3,922,015	Nov. 25, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 425,539	3,916,742	Nov. 4, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 425,541	3,914,051	Oct. 21, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 427,631	3,921,433	Nov. 25, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 428,177	3,914,624	Oct. 21, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 428,795	3,921,056	Nov. 18, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 429,442	3,923,485	Dec. 2, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 430,106	3,918,941	Nov. 11, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 430,140	3,922,084	Nov. 25, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 430,944	3,922,096	Nov. 25, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 432,373	3,919,670	Nov. 11, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 435,343	3,919,244	Nov. 11, 1975			

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

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Barbee, Robert B. Process for preparing a polyester fabric having desirable stain-release, antisoil-redeposition, antistatic and hydrophilic properties. T941,008, 12–2–75, Cl. 8—115.5.

Beech, John A.: *See*—
Giering, John E., Beech, and Camougis. T941,017.

Bevington, Richard E., Jr.: *See*—
Morrison, Kyle E., Bevington, Jr. and Duram. T941,011.

Blodinger, Jack. Anethelmintic method of treatment. T941,010, 12–2–75, Cl. 424—217.

Bosch, Robert, G.m.b.H.: *See*—
Kranzler, Ernst, and Kuhlmann. T941,019.

Camougis, George: *See*—
Giering, John E., Beech, and Camougis. T941,017.

Charron, William W., and M. W. Lunsford. Spill-proof vented enclosure. T941,014, 12–2–75, Cl. 261—72.

Clarke, Kenneth, to Imperial Chemical Industries, Ltd. Processes for the production of shaped articles. T941,018, 12–2–75, Cl. 156—69.

Corpening, Charles L., and T. E. Parsons III. Coating compositions. T941,001, 12–2–75, Cl. 260—17.

Crawford, Richard R.: *See*—
Freeman, Emma J., and Crawford. T941,007.

Dannelly, Clarence C. Reactive fillers for unsaturated resins. T941,004, 12–2–75, Cl. 260—862.

Davis, Thomas G., and J. G. Thompson. Polyester thermoplastic moldable composition capable of being molded into objects having improved physical properties. T941,003, 12–2–75, Cl. 260—75.

Deverell, Christopher: *See*—
Mathews, Carl F., Deverell, Pears, Duffield, and Knowles. T941,021.

Dibble, Merton. Apparatus for automatically sealing valve bags. T941,002, 12–2–75, Cl. 53—124.

Douglas, Ted L.: *See*—
Huffaker, James E., and Douglas. T941,013.

Dow Chemical Co., The: *See*—
Dowell, Frank H. T941,025.

Dowell, Frank H., to The Dow Chemical Co. Insecticidal device. T941,025, 12–2–75, Cl. 239—44.

Duffield, Alan: *See*—
Mathews, Carl F., Deverell, Pears, Duffield, and Knowles. T941,021.

Du Pont of Canada, Ltd.: *See*—
Hoyle, Clifford, and Huskilson. T941,015.

Duram, Robert E.: *See*—
Morrison, Kyle E., Bevington, Jr. and Duram. T941,011.

Durose, Arthur H.: *See*—
Snyder, Donald L., and Durose. T941,009.

Farnsworth, Richard G. Electrical impulse divider module with printed circuit interconnect matrix. T941,006, 12–2–75, Cl. 317—101.

Freeman, Emma J., and R. R. Crawford. Preparation of flowable, tabletable antioxidant mixture containing silicones. T941,007, 12–2–75, Cl. 252—400.

Freeman, Frederic R., and E. P. Kollar, to International Business Machines Corp. Apparatus for lifting tape edges above path of rotating head. T941,022, 12–2–75, Cl. 360—130.

Garrett Corp., The: *See*—
White, Randall F. T941,023.

Giering, John E., J. A. Beech, and G. Camougis, to Pennwalt Corp. Benzazocines as local anesthetics. T941,017, 12–2–75, Cl. 424—267.

Grant, Peter M. Non-cratering fusible polyester cellulose ester coating composition. T941,024, 12–2–75, Cl. 260—16.

Hester, Robert, and H. P. Pierson. Waste recovery of thermoplastic continuous filamentary material. T941,016, 12–2–75, Cl. 264—142.

Hoyle, Clifford, and L. C. Huskilson, to Du Pont of Canada, Ltd. Woven fabric having uniform air permeability and forming process. T941,015, 12–2–75, Cl. 139—420.

Huffaker, James E., and T. L. Douglas. Coating machine and method. T941,013, 12–2–75, Cl. 118—60.

Huskilson, Lewis C.: *See*—
Hoyle, Clifford, and Huskilson. T941,015.

Imperial Chemical Industries, Ltd.: *See*—
Clarke, Kenneth. T941,018.
Mathews, Carl F., Deverell, Pears, Duffield, and Knowles. T941,021.
Young, Roger N. T941,020.

International Business Machines Corp.: *See*—
Freeman, Frederic R., and Kollar. T941,022.

Kewanee Oil Co.: *See*—
Snyder, Donald L., and Durose. T941,009.

Knowles, Peter G.: *See*—
Mathews, Carl F., Deverell, Pears, Duffield, and Knowles. T941,021.

Kollar, Ernest P.: *See*—
Freeman, Frederic R., and Kollar. T941,022.

Kranzler, Ernst, and G. Kuhlmann, to Robert Bosch, G.m.b.H. Power tool. T941,019, 12–2–75, Cl. 30—376.

Kuhlmann, Gerhard: *See*—
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Lesser, Jean D. Automated block diagramming system. T941,005, 12–2–75, Cl. 444—1.

Lunsford, Max W.: *See*—
Charron, William W., and Lunsford. T941,014.

Marzocchi, Alfred. Friction material including glass fibers and method of manufacture. T941,012, 12–2–75, Cl. 65—3.

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Morrison, Kyle E., R. E. Bevington, Jr., and R. E. Duram. Automatic controlled apparatus for producing tobacco smoke filter rods. T941,011, 12–2–75, Cl. 93—1.

Parsons, Theron E., III: *See*—
Corpening, Charles L., and Parsons III. T941,001.

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Gibson, Earl D., to Rockwell International Corporation. High speed transmission receiver utilizing fine receiver timing and carrier phase recovery. Re. 28,638, Cl. 325-323.000.

Grunberg, Emanuel, to Hoffmann-La Roche Inc. Antibacterial composition containing 5-methyl-3-sulfanilamidoisoxazole and trimethoxybenyl pyrimidine. Re. 28,636, Cl. 424-229.000.

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CLASS 81
9.51 3,922,934
52.4R 3,922,935

CLASS 82
28 3,922,936

CLASS 83
99 3,922,937
100 3,922,938
299 3,922,939
364 3,922,940
417 3,922,941
620 3,922,942

CLASS 84
1.01 3,922,944
1.17 3,922,943
319 3,922,945

CLASS 85
1S 3,922,946
77 3,922,947

CLASS 89
1.5F 3,922,948
36L 3,922,949

CLASS 90
13.2 3,922,950
15R 3,922,951

CLASS 91
29 3,922,952
371 3,922,953
412 3,922,954
461 3,922,955
491 3,922,956

CLASS 92
137 3,922,957

CLASS 93
33H 3,922,958

CLASS 96
1SD 3,923,503
1.5 3,923,504
3,923,505
3,923,506
1.6 3,923,507
3,923,508
1.8 3,923,509
20 3,923,510
22 3,923,511
27R 3,923,512
29D 3,923,513
35 3,923,514
45.1 3,923,515
48R 3,923,516
50R 3,923,517
75 3,923,518
77 3,923,519
78 3,923,520
90R 3,923,521
115P 3,923,523
115R 3,923,522
140 3,923,524

CLASS 98
40A 3,922,959

CLASS 99
346 3,922,960
427 3,922,961

CLASS 100
53 3,922,962
118 3,922,963

CLASS 101
9 3,922,964
93.04 3,922,965
350 3,922,966
382MV 3,922,772

CLASS 102
38 3,922,967
70.2P 3,922,968

CLASS 104
8 3,922,969
91 3,922,970

CLASS 105
4R 3,922,971
153 3,922,972

CLASS 106
38.22 3,923,526
38.3 3,923,525
47R 3,923,527
52 3,923,528
3,923,529
53 3,923,530
54 3,923,533
56 3,923,531
59 3,923,532
62 3,923,534
84 3,923,535
100 3,923,536
277 3,923,537
298 3,923,538

CLASS 108
26 3,922,973

CLASS 110
8F 3,922,975
8R 3,922,974
9R 3,922,976

CLASS 111
1 3,922,977

CLASS 112
79A 3,922,979
147 3,922,978
197 3,922,980
218R 3,922,981
222 3,922,982
252 3,922,983

CLASS 113
120BB 3,922,984

CLASS 114
66.5R 3,922,994
74A 3,922,986
3,922,987
74R 3,922,985
165 3,922,988
209 3,922,989
221R 3,922,990
222 3,922,991
230 3,922,992
235R 3,922,993

CLASS 115
18R 3,922,995
3,922,996
37 3,922,997

CLASS 116
40 3,922,998
114Q 3,922,999
124R 3,923,000
173 3,923,001

CLASS 118
110 3,923,002
405 3,923,003
637 3,923,004

CLASS 119
1 3,923,005
37 3,923,006

CLASS 122
32 3,923,007
34 3,923,008
3,923,009
483 3,923,010

CLASS 123
1R 3,923,011
8.09 3,923,012
8.47 3,923,013
8.49 3,923,014
32EA 3,923,016
32B 3,923,015
32R 3,923,017
43A 3,923,018
53BA 3,923,019
103C 3,923,020
117A 3,923,023
117R 3,923,021
3,923,022
119B 3,923,024
140J 3,923,026
140R 3,923,025
141 3,923,027
146.5A 3,923,028
148E 3,923,029
3,923,030
179L 3,923,031
193P 3,923,032

CLASS 124
8 3,923,033
20R 3,923,034
24R 3,923,035
30R 3,923,036

CLASS 126
39C 3,923,037
271 3,923,038
3,923,039

CLASS 128
2F 3,923,040
2.06E 3,923,042
2.06R 3,923,041
2.08 3,923,043
25A 3,923,044
25R 3,923,045
75 3,923,046
80F 3,923,047
87R 3,923,048
91R 3,923,049
94 3,923,050
130 3,923,051
132D 3,923,052
142 3,923,053
145.5 3,923,054

145.8 3,923,055
3,923,056
188 3,923,057
218R 3,923,058
237 3,923,059
260 3,923,060
269 3,923,061
272 3,923,062
303.14 3,923,063
329A 3,923,064
348 3,923,065
3,923,066
360 3,923,067

CLASS 132

9 3,923,068
36CC 3,923,069
73 3,923,070

CLASS 134

2 3,923,539
3,923,540
31 3,923,541
47 3,923,071
57D 3,923,073
99 3,923,072

CLASS 135

5AT 3,923,074

CLASS 136

6GC 3,923,542
6LN 3,923,543
30 3,923,544
36 3,923,545
86R 3,923,546
107 3,923,547
133 3,923,548
134P 3,923,549
165 3,923,550
201 3,923,551
234 3,923,552

CLASS 137

68 3,923,080
217 3,923,081
491 3,923,075
495 3,923,076
546 3,923,077
597 3,923,078
614.14 3,923,079

CLASS 138

89 3,923,082

CLASS 139

12 3,923,083

CLASS 141

144 3,923,084
261 3,923,085

CLASS 144

134B 3,923,086
208B 3,923,087

CLASS 145

50A 3,923,088

CLASS 148

1.5 3,923,553
3,923,559
6.15Z 3,923,554
11.5A 3,923,555
16 3,923,556
32 3,923,557
32.5 3,923,558
120 3,923,560
147 3,923,561
187 3,923,562
189 3,923,563

CLASS 149

19.8 3,923,564
60 3,923,565

CLASS 151

41.73 3,923,089

CLASS 156

3 3,923,566
7 3,923,567
8 3,923,568
17 3,923,569
73.6 3,923,570
94 3,923,571
128 3,923,572
192 3,923,573
3,923,574
211 3,923,575
244 3,923,576
251 3,923,577
252 3,923,578
263 3,923,579
272 3,923,580
291 3,923,581
368 3,923,582
378 3,923,583
379 3,923,584
380 3,923,585
394 3,923,586
433 3,923,587
502 3,923,588
568 3,923,589
580 3,923,590

CLASS 157

1.5 3,923,090

CLASS 162

86 3,923,591
168 3,923,592
195 3,923,594
300 3,923,595
301 3,923,593

CLASS 164

4 3,923,091
274 3,923,092
282 3,923,093
337 3,923,094
404 3,923,095

CLASS 165

48 3,923,096
92 3,923,097
111 3,923,098

CLASS 166

249 3,923,099
281 3,923,100

CLASS 171

63 3,923,101

CLASS 172

13 3,923,102
201 3,923,103
730 3,923,104

CLASS 174

15C 3,924,054
40R 3,924,055
48 3,924,056
94R 3,924,057
140R 3,924,058

CLASS 175

4.55 3,923,105
3,923,106
3,923,107
227 3,923,108
340 3,923,109

CLASS 176

75 3,923,596

CLASS 177

210 3,923,110

CLASS 178

5.1 3,924,059
5.6 3,924,060
6 3,924,061
6.6R 3,924,062
3,924,063
6.7R 3,924,066
6.8 3,924,064
7.5DC 3,924,067
22 3,924,074
66R 3,924,065
88 3,924,068

CLASS 179

1GP 3,924,072
1SH 3,924,069
1VC 3,924,070
1H 3,924,073
1.5R 3,924,075
2A 3,924,071
15AL 3,924,077
15BF 3,924,078
15BS 3,924,080
15A 3,924,079
18BC 3,924,082
18EB 3,924,081
100.41M 3,924,076
149 3,924,083

CLASS 180

9.54 3,923,111
24.11 3,923,112
44R 3,923,113
54A 3,923,114
65A 3,923,115
65R 3,923,116
93 3,923,117

CLASS 181

.5 3,923,118
3,923,119
60 3,923,120
112 3,923,121
115 3,923,122
144 3,923,123
156 3,923,124

CLASS 184

6 3,923,125

CLASS 188

77W 3,923,126
82.1 3,923,127
251A 3,923,128

CLASS 191

45 3,924,084

CLASS 192

4B 3,923,129
12A 3,923,130
21 3,923,131
45.1 3,923,132
85R 3,923,133

CLASS 194

9T 3,923,134

CLASS 195

2 3,923,597
31R 3,923,598
66R 3,923,599
3,923,600
78 3,923,601
3,923,603
80R 3,923,602
139 3,923,604
142 3,923,605

CLASS 197

1R 3,923,135
17 3,923,136
19 3,923,137
3,923,139
64 3,923,140
151 3,923,141
179 3,923,138

CLASS 198

25 3,923,142
30 3,923,143
31AB 3,923,144
35 3,923,145
37 3,923,146
40 3,923,147
75 3,923,148
106 3,923,149
127R 3,923,150
203 3,923,151

CLASS 200

61.62 3,924,085
82R 3,924,086
144B 3,924,087
148A 3,924,088
159A 3,924,090
159R 3,924,089

CLASS 203

7 3,923,606
3,923,607

CLASS 204

1T 3,923,608
16 3,923,609
32R 3,923,610
35R 3,923,611
43G 3,923,612
52R 3,923,613
99 3,923,614
105M 3,923,615
107 3,923,616
119 3,923,617
157.1H 3,923,618
157.1R 3,923,619
158R 3,923,620
159.17 3,923,621
159.22 3,923,622
181 3,923,623
195G 3,923,625
195M 3,923,627
195R 3,923,626
195S 3,923,624
237 3,923,628
260 3,923,629
266 3,923,630
297W 3,923,631
301 3,923,632

CLASS 206

3 3,923,152
44.11 3,923,153
210 3,923,154
427 3,923,155
454 3,923,156

CLASS 208

6 3,923,633
10 3,923,634
50 3,923,635
58 3,923,636
89 3,923,637
3,923,638
111 3,923,639
3,923,640
3,923,641
164 3,923,642
179 3,923,643
186 3,923,644
206 3,923,645
216 3,923,646

CLASS 209

73 3,922,157
75 3,923,158
166 3,923,647

CLASS 210

12 3,923,648
20 3,923,649
21 3,923,650
3,923,651
67 3,923,652
71 3,923,653
75 3,923,654
83 3,923,655
86 3,923,656
95 3,923,657
108 3,923,658
179 3,923,659
222 3,923,660
242 3,923,661
251 3,923,662
3,923,663
321 3,923,664
501 3,923,665

CLASS 211

49D 3,923,159
73 3,923,160
117 3,923,161
119 3,923,162

CLASS 212

54 3,923,163

CLASS 213

75R 3,923,164

CLASS 214

1BB 3,923,168
1BE 3,923,165
1CM 3,923,166
1D 3,923,167
42R 3,923,169
86A 3,923,170
141 3,923,172
301 3,923,173
313 3,923,174
509 3,923,175
518 3,923,176
650SG 3,923,177

CLASS 215

1C 3,923,178
203 3,923,179
216 3,923,180
224 3,923,181
250 3,923,182
251 3,923,183
3,923,184
253 3,923,185

CLASS 219

73 3,924,091
76 3,924,092
121LM 3,924,093
125PL 3,924,094
125R 3,924,095
130 3,924,096
242 3,924,097
345 3,924,098
371 3,924,099
386 3,924,100
490 3,924,101
497 3,924,102
528 3,924,103

CLASS 220

2.3R 3,923,189
5R 3,923,186
19 3,923,187
20 3,923,188
67 3,923,190
94R 3,923,191
235 3,923,192
269 3,923,193
275 3,923,194
309 3,923,195
335 3,923,196
344 3,923,197
359 3,923,198

CLASS 221

73 3,923,199
221 3,923,200

CLASS 222

64 3,923,201
145 3,923,202
153 3,923,203
228 3,923,204
309 3,923,205
371 3,923,206
386 3,923,208
478 3,923,209
494 3,923,210
528 3,923,211

CLASS 223

88 3,923,212
96 3,923,213

CLASS 224

2B 3,923,214
5C 3,923,215
8R 3,923,216
9 3,923,217
32A 3,923,218
42.03A 3,923,219
42.03B 3,923,220
3,923,221
58 3,923,222

CLASS 225

46 3,923,223

CLASS 226

7 3,923,224

CLASS 227

8 3,923,225
3,923,226
3,923,227
132 3,923,228
144 3,923,229

CLASS 228

141 3,923,230
194 3,923,231
221 3,923,232

CLASS 229

5.5 3,923,233
37E 3,923,234
39B 3,923,235
40 3,923,236
43 3,923,237
48T 3,923,238
51C 3,923,239

CLASS 233

7 3,923,241

CLASS 234

128 3,923,242

CLASS 235

61B 3,924,104
61.11E 3,924,105
88R 3,923,243
92PC 3,924,106
150.2 3,924,107
152 3,924,108
153AC 3,924,109
156 3,924,110
3,924,111
3,924,112
181 3,924,113

CLASS 236

49 3,923,244

CLASS 238

347 3,923,245

CLASS 239

2S 3,923,246
14 3,923,247
113 3,923,248
212 3,923,249
321 3,923,250
402.5 3,923,251
411 3,923,252
463 3,923,253

CLASS 240

6.4R 3,924,114
3,924,115
7.1R Re.28,637
10.6R 3,924,116
3,924,117
11.2A 3,924,118
52R 3,924,119

CLASS 241

30 3,923,254
56 3,923,255
76 3,923,256
101.7 3,923,257
207 3,923,258
278R 3,923,259

CLASS 242

18A 3,923,260
35.6E 3,923,264
35.6R 3,923,263
46.2 3,923,261
47.01 3,923,262
55.16 3,923,266
55.2 3,923,265
67.4 3,923,267
68.3 3,923,268
107.4 3,923,269
163 3,923,270
199 3,923,271
3,923,272

CLASS 244

3.16 3,923,273
115 3,923,274
137R 3,923,275

CLASS 248

16 3,923,276
49 3,923,277
301 3,923,278
318 3,923,279
405 3,923,280

CLASS 249

219R 3,923,281

CLASS 250

199 3,924,120
226 3,924,121
236 3,924,122
251 3,924,123
281 3,924,124
303 3,924,125
311 3,924,126
323 3,924,127
328 3,924,128
336 3,924,129
342 3,924,130
360 3,924,131
361 3,924,132
408 3,924,133
423 3,924,134
484 3,924,135
492A 3,924,136
499 3,924,137
502 3,924,138
527 3,924,139

CLASS 251

63.4 3,923,282
77 3,923,283
172 3,923,284
200 3,923,285

CLASS 252

8.55C 3,923,666
12 3,923,667
16 3,923,668
32.7E 3,923,669
42.7 3,923,670
49.5 3,923,671
49.9 3,923,672
56S 3,923,702
59 3,923,673
62 3,923,674
62.9 3,923,675
63.2 3,923,676
89 3,923,677
3,923,678
182 3,923,680
300 3,923,681
301.6P 3,923,682
321 3,923,683
408LC 3,923,685
408 3,923,684
417 3,923,686
429C 3,923,687
432 3,923,688
444 3,923,689
447 3,923,690
455R 3,923,691
3,923,692
459 3,923,693
463 3,923,694
465 3,923,695
467 3,923,696
506 3,923,697
518 3,923,698
522 3,923,699
3,923,700
544 3,923,701

CLASS 254

84 3,923,286
135R 3,923,171
150R 3,923,287

CLASS 259

4 3,923,288
22 3,923,289
99 3,923,679
191 3,923,290
192 3,923,291

CLASS 260

2A 3,923,703
2.5EP 3,923,922
2.5B 3,923,706
2.5N 3,923,704
2.5S 3,923,705
17R 3,923,707
22R 3,923,708
28.5AV 3,923,711
28.5B 3,923,712
29.2TN 3,923,713
29.6MM 3,923,716
29.6WB 3,923,714
29.6R 3,923,715
29.6S 3,923,717
29.7UA 3,923,718
30.8R 3,923,719
31.2R 3,923,720
32.8A 3,923,722
32.8R 3,923,721
33.6AQ 3,923,724
33.6UA 3,923,723
37EP 3,923,725
40P 3,923,727
40R 3,923,726
3,923,728
3,923,729
42.21 3,923,730
42.42 3,923,731
45.75B 3,923,734
45.8NE 3,923,733
45.85R 3,923,735
46.5G 3,923,736
47EP 3,923,739
47ET 3,923,738
47UA 3,923,737
3,923,740
67UA 3,923,742
75NT 3,923,743
77.5AN 3,923,747
77.5AP 3,923,744
3,923,746
3,923,926
77.5CR 3,923,745
3,923,748
78A 3,923,751
78L 3,923,749
78R 3,923,750

78.5E 3,923,752
79 3,923,753
3,923,754
79.3MU 3,923,755
80.3N 3,923,756
80.75 3,923,757
88.2R 3,923,760
88.2 3,923,758
3,923,759
88.3A 3,923,761
89.5 3,923,762
92.3 3,923,763
92.8R 3,923,764
3,923,766
92.8W 3,923,765
94.9R 3,923,767
97.5 3,923,768
112.5R 3,923,771
112.5 3,923,769
3,923,770
3,923,772
152 3,923,773
154 3,923,774
3,923,775
156 3,923,776
157 3,923,777
174 3,923,778
202 3,923,779
207 3,923,780
209R 3,923,781
3,923,782
210AB 3,923,783
210E 3,923,784
211.5R 3,923,785
239BF 3,923,786
239.1 3,923,787
3,923,788
3,923,789
239.3B 3,923,790
239.3P 3,923,791
239.75 3,923,792
240A 3,923,794
240F 3,923,793
240K 3,923,709
243A 3,923,800
243C 3,923,795
3,923,797
3,923,798
3,923,799
243R 3,923,796
3,923,801
248C 3,923,802
251QB 3,923,710
3,923,803
251R 3,923,804
253 3,923,805
256.4C 3,923,806
3,923,807
256.4F 3,923,808
256.5R 3,923,809
3,923,810
270D 3,923,811
285.5 3,923,812
293.53 3,923,814
293.55 3,923,816
293.62 3,923,813
3,923,815
293.87 3,923,817
294.8G 3,923,818
294.9 3,923,819
295AM 3,923,820
296D 3,923,821
297R 3,923,822
299 3,923,823
307F 3,923,824
307H 3,923,825
309.5 3,923,826
309.6 3,923,827
326N 3,923,828
326.47 3,923,829
329R 3,923,830
335 3,923,831
340.5 3,923,832
3,923,833
340.6 3,923,834
343.6 3,923,835
345.2 3,923,836
3,923,837
346.3 3,923,838
346.7 3,923,839
347.2 3,923,840
347.3 3,923,841
348R 3,923,842
348.5L 3,923,843
348.6 3,923,844
369 3,923,845
404 3,923,846
412.8 3,923,847
413 3,923,848
448R 3,923,849
453PC 3,923,850
453PH 3,923,732
454 3,923,851
3,923,852
3,923,853
455A 3,923,854
456R 3,923,855
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518	3,924,011	14	3,924,019	162	3,924,020	431	3,924,036	373	3,924,045	71	3,923,445
	3,924,012	35	3,924,021	175	3,924,028		CLASS 428	375	3,924,046	114	3,923,446
523	3,924,013	54	3,924,022	213	3,924,029	15	3,924,037	378	3,924,047	326	3,923,447
534	3,924,014		3,924,023		3,924,030	49	3,924,038	404	3,924,048	354	3,923,448
538	3,924,015	84	3,923,975	217	3,924,031	119	3,924,039	409	Re.28,635		CLASS 432
540	3,924,016	95	3,924,024	220	3,924,032	141	3,924,040	411	3,924,049	59	3,923,449
548	3,924,017	126	3,924,025	226	3,924,033	212	3,924,041	413	3,924,050	115	3,923,450
564	3,924,018	146	3,924,026	228	3,924,034	261	3,924,043	520	3,924,051	138	3,923,451

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D2—	233	237,843			237,855		53	237,866			237,879		R 237,890		F 237,902
	249	237,844		107	237,856		62	237,868			237,880		14B 237,892	D61—	Q 237,904
	428	237,845		211	237,857		83	237,869	D22—	22	237,881		K 237,893		237,905
D6—	32	237,846	D8—	59	237,858		103	237,870	D23—	19	237,882	D30—	13 237,894	D64—	11R 237,906
	66	237,848		247	237,859	D12—	26	237,871			237,883	D32—	2 237,895	D77—	1A 237,907
	69	237,847	D9—	23	237,860			237,872		65	237,884	D34—	5CH 237,896	D83—	H 237,908
	142	237,849		44	237,861		87	237,873		66	237,885		K 237,897		8A 237,909
	149	237,850		63	237,862		115	237,874			237,886	D35—	3A 237,898	D92—	15 237,910
	162	237,851		168	237,863		146	237,875		71	237,887	D48—	20E 237,899	D95—	3A 237,911
	251	237,852		192	237,864		162	237,876		90.1	237,888	D55—	1D 237,901		237,912
D7—	15	237,853			237,865	D19—	62	237,877	D26—	1B	237,889		G 237,900		237,913
	79	237,854	D10—	50	237,867			237,878		13C	237,891	D57—	A 237,903		

CLASSIFICATION OF PLANTS

P. —	77	3,812	P. —	3,813									

DEFENSIVE PUBLICATIONS APPLICATIONS

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8—	115.5	T941,008	93—	1C	T941,011	139–420R		T941,015	260—	16	T941,024	261—	72R T941,014	424—	217 T941,010
29—	194	T941,009	96—	87R	T941,021	156—	69	T941,018		17R	T941,001	264—	142 T941,016		267 T941,017
30—	376	T941,019	114—	5F	T941,023	239—	44	T941,025		75SB	T941,003	317—	101R T941,006	428—	349 T941,020
53—	124A	T941,002	118—	60	T941,013	252–400R		T941,007		862	T941,004	360—	130 T941,022	444—	1 T941,005
65—	3	T941,012													

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PATENTS

	3,923,516	3,922,903	3,923,288	3,924,146	3,923,555	3,923,003
	3,923,528	3,922,904	3,923,292	3,924,152	3,923,557	3,923,193
	3,923,887	3,922,915	3,923,312	3,924,158	3,923,558	3,923,236
	3,923,889	3,922,920	3,923,330	3,924,167	3,923,590	3,924,157
	3,923,902	3,922,935	3,923,333	3,924,176	3,923,620	3,924,179
1 :	3,922,783	3,922,957	3,923,367	3,924,181	3,923,731	3,924,235
	3,923,084	3,922,961	3,923,372	3,924,185	3,923,732	15 : 3,922,753
	3,923,090	3,922,963	3,923,374	3,924,189	3,923,791	3,922,812
	3,923,308	3,922,965	3,923,376	3,924,190	3,923,844	17 : Re.28,635
	3,923,383	3,922,968	3,923,387	3,924,193	3,923,891	3,922,745
	3,923,402	3,922,975	3,923,413	3,924,229	3,924,036	3,922,813
	3,924,071	3,922,994	3,923,426	3,924,232	3,924,061	3,922,833
	3,924,194	3,923,001	3,923,427	3,924,233	3,924,132	3,922,855
2 :	3,922,992	3,923,002	3,923,445	3,924,234	3,924,139	3,922,883
	3,923,121	3,923,005	3,923,462	3,924,239	3,924,161	3,922,940
	3,923,443	3,923,020	3,923,494	3,924,241	3,924,230	3,923,032
4 :	3,922,945	3,923,024	3,923,537	3,924,247	10 : 3,923,472	3,923,034
	3,923,038	3,923,029	3,923,545	3,924,249	3,923,473	3,923,048
	3,923,174	3,923,036	3,923,567	3,924,250	3,923,474	3,923,052
	3,923,216	3,923,043	3,923,568	3,924,251	3,923,509	3,923,058
	3,923,217	3,923,046	3,923,575	3,924,262	3,923,616	3,923,076
	3,923,339	3,923,059	3,923,604	3,924,265	3,923,715	3,923,082
	3,923,342	3,923,062	3,923,612	3,924,267	3,923,745	3,923,111
	3,923,439	3,923,068	3,923,640	3,924,268	3,923,786	3,923,159
	3,923,448	3,923,071	3,923,663	8 : 3,922,749	3,923,966	3,923,167
	3,923,617	3,923,102	3,923,674	3,922,810	3,923,967	3,923,181
	3,924,079	3,923,117	3,923,685	3,922,866	3,924,014	3,923,190
5 :	3,922,978	3,923,118	3,923,711	3,922,909	11 : 3,923,377	3,923,235
	3,923,892	3,923,135	3,923,748	3,922,985	12 : 3,922,876	3,923,237
6 :	Re.28,638	3,923,143	3,923,754	3,922,998	3,922,887	3,923,252
	3,922,721	3,923,165	3,923,796	3,923,006	3,922,913	3,923,287
	3,922,723	3,923,169	3,923,802	3,923,074	3,922,918	3,923,313
	3,922,730	3,923,176	3,923,832	3,923,245	3,922,923	3,923,318
	3,922,733	3,923,179	3,923,843	3,923,635	3,922,924	3,923,323
	3,922,736	3,923,182	3,923,856	3,923,959	3,923,014	3,923,327
	3,922,740	3,923,183	3,923,860	3,924,243	3,923,180	3,923,337
	3,922,746	3,923,184	3,923,868	9 : 3,922,952	3,923,304	3,923,341
	3,922,762	3,923,185	3,923,871	3,922,976	3,923,345	3,923,346
	3,922,776	3,923,196	3,923,894	3,922,977	3,923,397	3,923,378
	3,922,787	3,923,203	3,923,939	3,923,039	3,923,697	3,923,381
	3,922,788	3,923,208	3,923,949	3,923,138	3,923,837	3,923,425
	3,922,795	3,923,220	3,923,964	3,923,209	3,923,961	3,923,453
	3,922,802	3,923,221	3,923,968	3,923,229	3,923,984	3,923,531
	3,922,828	3,923,231	3,924,050	3,923,289	3,924,069	3,923,541
	3,922,849	3,923,249	3,924,053	3,923,354	3,924,130	3,923,606
	3,922,860	3,923,253	3,924,062	3,923,364	3,924,154	3,923,646
	3,922,864	3,923,265	3,924,077	3,923,366	3,924,186	3,923,647
	3,922,870	3,923,268	3,924,097	3,923,421	3,924,201	3,923,660
	3,922,878	3,923,273	3,924,109	3,923,422	3,924,212	3,923,662
	3,922,879	3,923,277	3,924,111	3,923,491	13 : 3,922,789	3,923,683
	3,922,892	3,923,278	3,924,136	3,923,546	3,922,902	3,923,694

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3,923,107	3,923,689	3,924,215	3,923,461	3,923,219	3,922,996
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3,923,163	3,923,763	3,924,260	3,923,988	54 : 3,922,999	3,923,284
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3,923,343	3,923,958	50 : 3,922,738	3,924,125	3,923,821	3,923,532
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DESIGN PATENTS

4 : 237,898	237,878	25 : 237,904	237,891	237,884	237,895
6 : 237,858	237,879	26 : 237,859	36 : 237,871	237,885	44 : 237,889
237,872	237,880	237,868	237,888	237,886	237,899
237,873	12 : 237,861	27 : 237,874	237,902	237,908	47 : 237,881
237,883	17 : 237,849	237,910	237,905	42 : 237,843	48 : 237,876
237,894	237,850	32 : 237,907	237,909	237,847	237,897
8 : 237,844	237,896	34 : 237,864	39 : 237,853	237,848	53 : 237,857
9 : 237,852	237,906	237,865	237,854	237,851	55 : 237,856
237,870	18 : 237,900	237,869	237,855	237,867	237,862
237,877	24 : 237,860	237,887			

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

6 : T941,025	34 : T941,010	39 : T941,009	T941,002	T941,007	T941,013
8 : T941,022	T941,023	44 : T941,012	T941,003	T941,008	T941,016
23 : T941,006	36 : T941,005	47 : T941,001	T941,004	T941,011	T941,024
26 : T941,014	T941,017				

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*